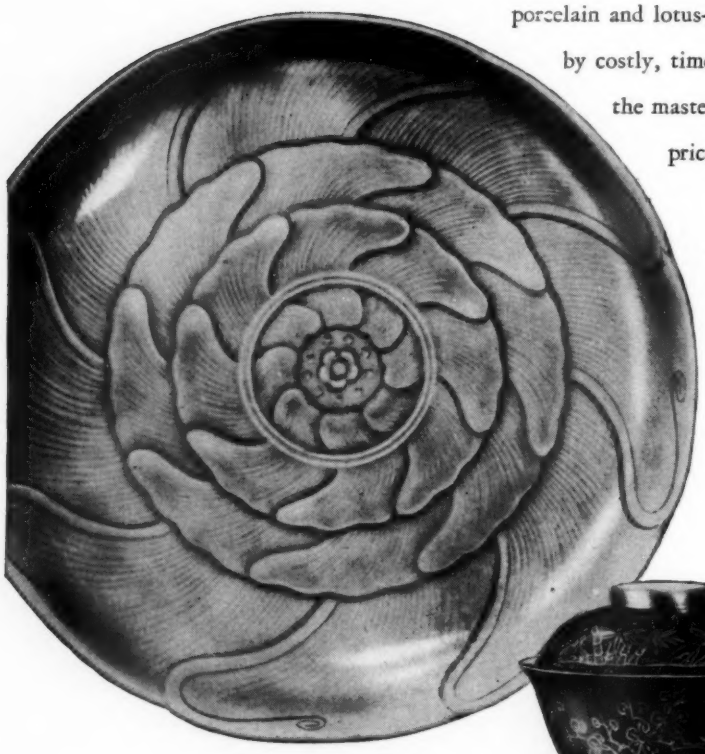
AMERICAN GAS MONTHLY

JANUARY 1948 VOL. 30 NO. 1

the Chinese had no Gas

Ancient Chinese masters of ceramic art produced lovely Ch'ien Lung porcelain and lotus-patterned celadon for emperors and mandarins by costly, time-consuming firing with wood and grass. Now the masters and their patrons are gone, but they left a priceless heritage to modern ceramic artists.



Today these modern ceramists have GAS—dependable fuel for all ceramic firing. Automatic Gas equipment for the ceramic industry has removed the guesswork from heating operations; losses due to overheating or irregular temperatures no longer appear on operating records.

Modern production methods reproduce porcelain and china treasures as articles of commerce. GAS, efficient production fuel, fires the kilns, dryers, smelters, decorating ovens, in hundreds of plants manufacturing fine table and decorative ware.

Why not call the Industrial Representative at your local Gas Company for latest information on Gas-firing as applied to your manufacturing process?

AMERICAN GAS ASSOCIATION
420 LEXINGTON AVENUE, NEW YORK 17, N.Y.

MORE AND MORE...

THE TREND IS TO GAS

FOR ALL
CERAMIC FIRING

The gas industry starts a new page and new chapter in its history with high confidence and optimism, rooted in the impressive record of the year just completed. In 1946, as President Hargrove so ably points out in the feature article, despite handicaps general to all business the industry established new records and gained increased stature in the public mind. It is a record of which all who have helped make it can well be proud. . . . A strong plank in the industry's 1947 bid for fame and fortune is that of increased national advertising. Chairman Hartson gives the background, the copy platform and the future plans in a campaign which has been hailed by many advertising authorities as a model association endeavor. . . . Increased promotional efforts all along the line are in order for the new year and W. J. Schmidt points a finger at Home Service which, he says, should be an important factor in water heating promotion. His article is backed by a solid foundation of experience in selling this neglected load. . . . Symbolic perhaps of the industry's trail-blazing efforts into uncharted territory is the experiment in underground gasification described herein. For the first time in this country, a full scale test is being made of a method that could *revolutionize gas operating practice. . . . Happy New Year!*

JAMES M. BEALL
EDITOR
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The Gas Industry in 1946

BY R. H. HARGROVE

President, American Gas Association
Vice-President and General Manager, United Gas Pipe Line Co., Shreveport, La.

THE gas industry completed the year 1946 with an enviable record. On the one hand it demonstrated its traditional stability and soundness by passing through the difficult reconversion period without losing a step in its march of progress. All-time records were established in every category of the industry with the exception of industrial sales which levelled off from wartime peaks, reflecting general unsettled business conditions. On the other hand, the industry's vitality and determination to advance was made crystal clear by the industry's great postwar research and promotional program—an effort of unprecedented magnitude in the 130-year history of the industry. More people used gas than ever before and more innovations in gas appliances appeared on the market than in any year in the past decade. In short, it was a banner year, auguring well for the future prosperity of the industry.

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At the close of the year, customers of the gas utility companies reached a new high of 20,835,000, an increase of 2.7 percent over 1945. Of this number, 9,401,000 consumers received natural gas, 8,973,000 were served with manufactured gas and 2,461,000 used mixed gas. In addition, the rapidly expanding liquefied petroleum gas industry accounted for an estimated more than 3,000,000 customers in the rural territories beyond the town gas mains.

Total industry revenues of the utility gas industry aggregated $1,205,992,000, an increase of 4 percent as compared with the previous year. Most substantial increases occurred in the residential and commercial classifications while industrial revenues maintained their high 1945 levels.

Natural gas revenues were more than $705,000,000, an increase of 3.4 percent, while revenues from manufactured gas jumped 5.6 percent over 1945 to approximately $392,000,000. Mixed gas returns advanced 2.4 percent to a total of $109,000,000.

Sales of natural gas, totaling 2,192,778,000 M cubic feet, were slightly greater than in the previous year, with substantial increases being recorded in residential and commercial gas. Manufactured gas sales were 412,053,000 M cubic feet or 4.2 percent higher, while mixed gas sales advanced 3.7 percent to 145,832,000 M cubic feet. In both instances, residential and commercial gas registered gains in the neighborhood of 8 percent as compared with 1945.

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While, generally speaking, the gas industry's progress has been widely held to have been steady but unspectacular, a comparison of 1946 figures with those of a decade ago reveals significant, if not startling advances. The gas industry, not including the LP-gas branch, has gained 26.6 percent in total consumers attached to its lines, 77 percent in sales volume and 57 percent in total revenues.

Indicative of the rapid growth anticipated, it is estimated that in the four years, 1946 to 1949 inclusive, the gas utility industry will add 2,535,000 new customers (not including the LP-gas industry). Further, it is calculated that during this four-year period construction expenditures will be $653,323,000 for physical plant extension; $278,413,000 for ordinary maintenance expenditures; and $14,430,500 for house piping materials—a grand total of $946,166,500.

By far the most outstanding phenomenon of the year was the tremendous demand for gas heating. Whether or not a gas company was promoting house heating, this winter load has accumulated like a snowball to mammoth proportions. An avalanche of conversion burner sales occurred immediately following the rescinding of the natural gas limitation order in September, 1945. In many large metropolitan centers,

● Opposite: Symbolic of the growth of natural gas pipe lines is this scene of a welder at work on the 18-inch Goleta line east of Hall Canyon. Oil line can be seen at lower right. Photograph is by Mel Jones of Southern California Gas Company.

such as Detroit, dozens of new conversion burner manufacturers sprang up overnight to supply this demand.

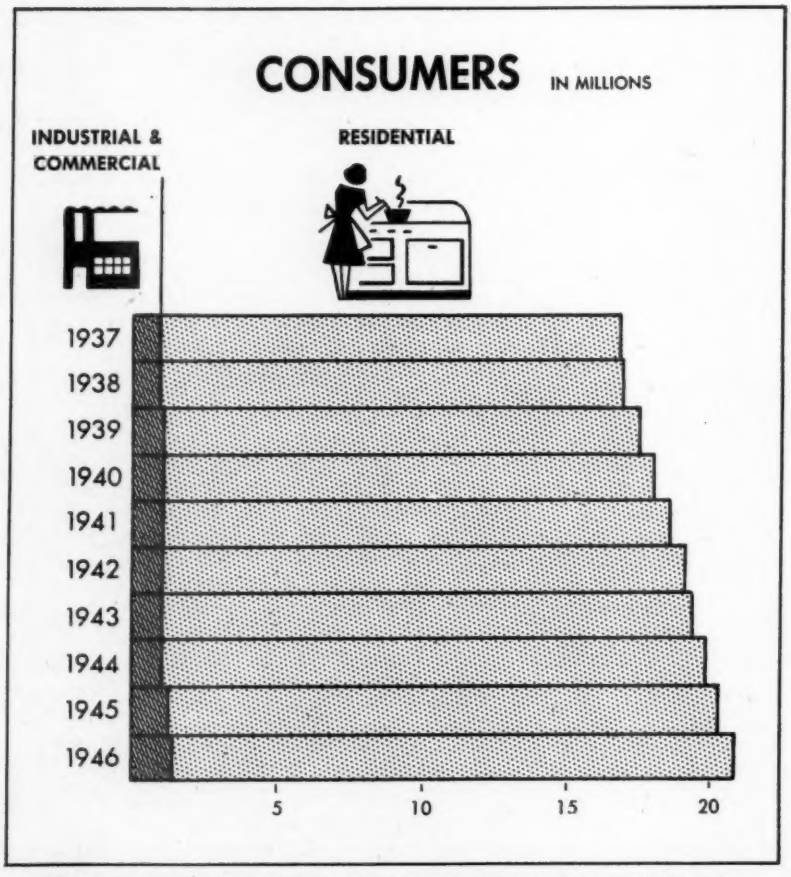
Not only in the existing market but also in the new home field, a strong preference for gas heating was apparent. The National Housing Agency, for example, reported recently that of the 629,000 dwelling units planned under the veterans' emergency housing program up to July 26, 1946, gas heating systems were specified in 52 percent, with coal and oil amounting to 27 and 21 percent respectively.

Appliance Production

All factors considered, creditable levels of appliance production were attained at the year's end. Sales of automatic gas water heaters totalled 1,250,000 units—an all-time high level. Expanded production facilities, when unhampered by labor and supply curtailments, will enable this branch of the industry to more than double its 1941 peak production.

The trend in water heaters is toward larger sizes to supply the increasing needs for instantly available supplies of hot water for automatic home laundry equipment, dishwashers, and other uses. A lucrative market for large volume gas water heaters was created with the introduction and rapid growth of chain-store laundryettes. Typical installations of the latter require 600 gallons of hot water per hour and are open from morning to night.

Gas range production during the year reached 1,600,000 units. A substantial portion of the range output was devoted to veterans' housing and the number of "apartment" or "cooker" models produced was considerably greater than in the peak production year of 1941. Production potential of the range manufacturers has jumped nearly 100 percent as compared with 1941.



TREND OF UTILITY GAS CONSUMERS (1945 DATA PRELIMINARY; 1946 DATA ESTIMATED)

The total number of homes heated by gas increased more than 15 percent during the year, with demand far outstripping the supply. Gas house heating units produced totaled more than 600,000.

Keeping pace with other branches of the industry, manufacturers of gas commercial and industrial equipment have substantially increased their production capacity.

Appliance Developments

Emerging from the strait-jacket of wartime restrictions but still bedevilled with peacetime material and labor problems, gas appliance and equipment manufacturers gave a remarkable exhibition of their products during the annual convention last fall. More than 160 separate manufacturers displayed hundreds of new or improved appliances in the largest exhibition of such equipment ever held.

Of particular interest in the domestic appliance field was the marked trend toward automatic operation of gas equipment apparent at the exhibition. For the first time at such an exposition, at least ten new manufacturers featured automatic lighting of appliances.

Among the new products which made their bow this year were an automatic gas-fired home disposal unit and a low pressure steam cooker which could be incorporated in a modern gas range or available as a separate unit. The latter innovation, offering a fourth cooking zone, is ideal for vegetable cooking or for defrosting frozen foods.

An interesting development in the house heating field was a midget gas furnace, weighing 70 lbs., capable of heating two-and-one-half rooms, which had its origin in the airplane heaters developed during the war. Gas radiant heating, which turns walls, floors or ceilings into spacious heating panels—no radiators, no register grillwork—is gaining wide acceptance by builders who previously let it lie in the laboratory. The largest such system on record was installed late in 1946 in a factory building in Illinois. It consists of 40 miles of piping and will circulate 15,000 gallons of hot water 12 times an hour or a total circulation of 180,000 gallons per hour.

During the past year, the gas turbine caught the interest of people concerned

with new primary sources of power and successful trials of a number of large oil-fired gas turbines were completed by the Navy. This initial success has prompted producers to experiment with gas-operated gas turbines.

Natural Gas Expansion

The natural gas industry in the past decade has grown at an accelerated pace. It now serves an area with a population of 41 million in 33 states using a network of 220,000 miles of trunk lines and mains with a total production of four trillion cubic feet, including other than utility sales, and a market value of 850 million dollars. It has advanced from 41 to 48 percent in the number of customers served by the whole gas industry. Total assets are more than four billion dollars.

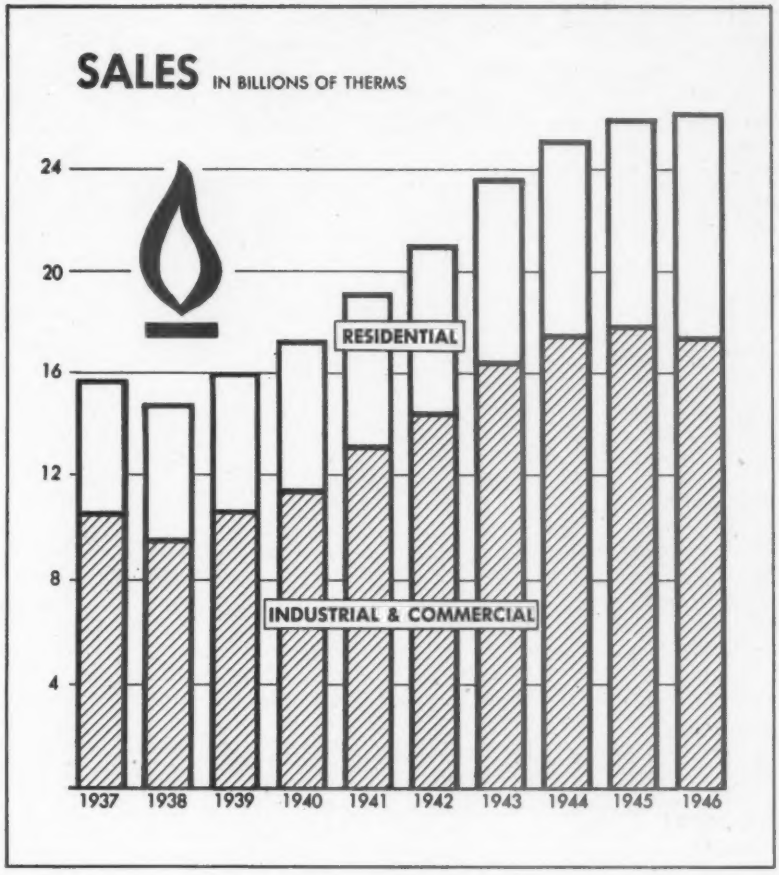
Approval of new long distance pipeline construction continues at a rapid pace. A new 1200-mile line from Texas to California with a capacity of 305 million cubic feet per day is now being built at a cost of 70 million dollars. Other pipeline projects approved and under way this past year involve a total additional mileage of 2,640 miles and an expenditure of 120 millions of dollars.

The impending disposal by the government of the Inch pipelines from Texas to the northeast has excited a lively interest on the part of the manufactured gas industry in the latter area in the economic possibilities of natural gas as a raw material in the manufactured gas process. A natural gas supply to large metropolitan areas of the northeast may come in the near future.

Proved recoverable reserves of natural gas in the United States as of December 31, 1945, were approximately 148 trillon cubic feet, the Association's Committee on Natural Gas Reserves has reported, thus indicating an ample supply to meet the stepped-up demand for many years to come.

Development of synthetic gasoline from natural gas that appears to be competitive with gasoline produced from petroleum is a notable recent event. A huge plant is being erected in Texas for this purpose and others are contemplated.

Also noteworthy is the increasing recognition of the chemical values represented by natural gas and its products. During the last decade, a rapidly increasing chemical development, based on petroleum hydrocarbons, has occurred and the present trend is toward greatly increased utilization of the natural hydrocarbons as raw materials and intermediates. According to chemical experts, this spectacular trend reflects the growing realization by oil and gas companies and chemical companies that the natural hydrocarbons are ideal raw materials for synthetic chemicals.



TREND OF UTILITY GAS SALES (1945 DATA PRELIMINARY; 1946 DATA ESTIMATED)

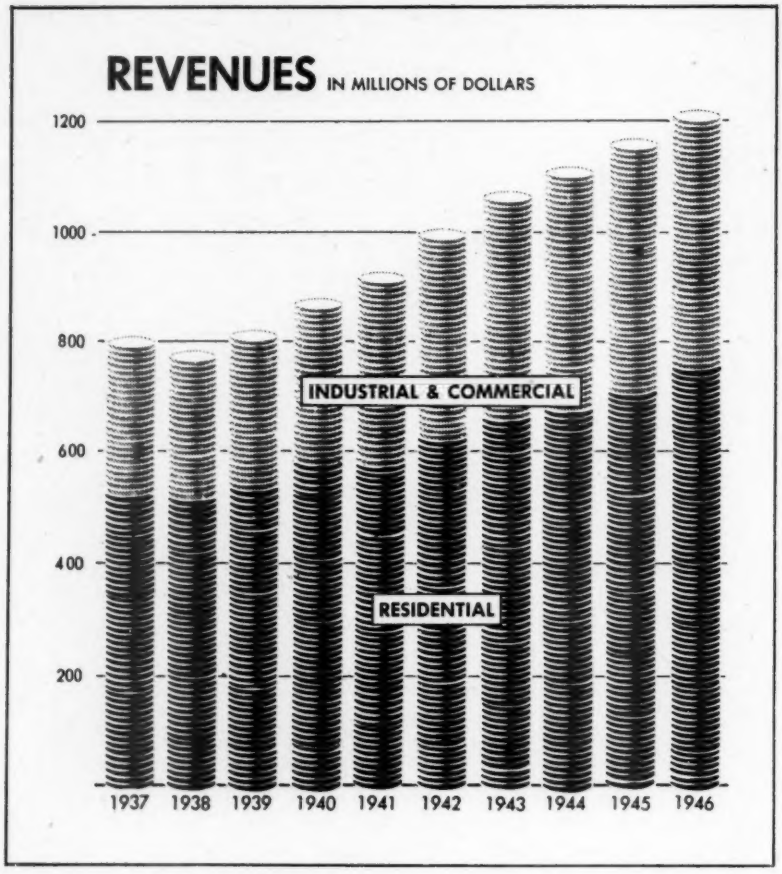
The natural gas investigation sponsored by the Federal Power Commission held an important spotlight. Regional hearings were completed at Washington on August 2, after seven hearings in various parts of the country. More than 14,000 pages of testimony, with over 450 exhibits, were submitted by 314 expert witnesses from State and Federal commissions and bureaus, the gas, coal and railroad industries, labor unions and others. This record will form the basis of F. P. C. recommendations to the 1947 Congress.

Research and Promotional Plan

The Association's Research and Promotional Plan, launched October 1, 1944, has been the main motivating force responsible for the gas industry's rapid progress immediately following the war. Gas company subscriptions totalling more than $1,600,000 per year, in addition to the regular Association budget, are being expended for research, promotion and advertising.

An entirely new field of endeavor in the history of the Association is the gas production research feature of the industry plan, which calls for the discovery of better and cheaper methods of producing gas for the benefit of the ultimate consumer. Partly as a result of this activity, plant capacities to meet peak loads in the manufactured gas industry have been increased an estimated 35 percent over the past two years.

A great deal has been accomplished in developing greater plant capacities



TREND OF UTILITY GAS REVENUES (1945 DATA PRELIMINARY; 1946 DATA ESTIMATED)

through the reforming of hydrocarbon gases and by other equipment and process modifications. Pilot plant tests have been arranged on catalytic reforming of certain sulfur-free raw materials to produce blue gas, and the full possibilities of mixing a variety of gases in the interest of greater plant capacities are being further explored.

Much time has been devoted to the task of determining which new gas production processes offer sufficient promise to justify further research on a laboratory or pilot plant scale. Of those investigated, the fluidization process is being further explored on a laboratory research basis. The possibility of using high coke oil in a regenerative oil gas set for the production of a high B.t.u. gas is also scheduled for an early plant scale test. The analysis of the components of water-gas-tar in order to improve its dehydration and treatment and upgrade its commercial value is under way.

Basic studies have included laboratory determinations of the fundamental reactions between oxygen-steam and carbon, and between steam and carbon, and a search for sulfur-resistant catalysts.

Utilization Research

The gas industry, through its Association, has under way a comprehensive research program designed to improve domestic, industrial and commercial utilization and to develop new uses for gas. This work is carried on in close cooperation with the manufacturers of gas appliances and equipment.

Domestic gas research is furthered by analyzing the fundamental technical position of each present and proposed use of gas in the home, and assigning definite research projects to outstanding organizations in connection with each use. In addition, the gas flame is literally being torn apart in the laboratory to bring out every scientific factor that has a bearing on its efficiency and heating ability under conditions of use. Controls, safety devices and accessories are being thoroughly analyzed to bring out their maximum effectiveness.

Research projects in this program include cooking, water heating, space heating, summer air-conditioning, venting, and burners, controls and accessories. In every one of these fields, there is a steady and noticeable improvement in appliances, equipment and installation practices. Not only have new designs of standard appliances, which incorporate appealing and useful features made their postwar appearance, but entirely new uses of gas are being made possible by postwar appliance developments.

In carrying out the gas industry's program of research specialized technical projects have been assigned to Battelle Memorial Institute, Columbus; Case School of Applied Science, Cleveland; Institute of Gas Technology, Chicago; Arthur D. Little, Inc., Cambridge; Purdue Research Foundation, Lafayette; and the A. G. A. Testing Laboratories, Cleveland. Coordination is through technical advisory groups of outstanding gas company and appliance manufacturer engineers.

Pursuing a course of investigation in the field of natural gas comparable to work done in manufactured gas production, a report on the interchangeability of other fuel gases with natural gases has been published. Data covering the performance of appliances adjusted for natural gas when various kinds of supplemental gas mixtures are employed has been plotted to provide operators with quick and ready means of obtaining necessary factors for interchanging gas fuels for peak loads.

Other projects cover a variety of subjects ranging from exploration of new methods for the application of gas to cooking through the range of industrial and commercial uses to the possibilities of storing natural gas in hydrate form.

National Advertising

The gas industry's national advertising program, financed by gas utility companies throughout the country,

spent in excess of $850,000 in 1946 for advertising gas appliances, equipment and services. This represents a stepping up of total circulation of magazines used from 47,500,000 to 57,000,000 and of total messages from 215,000,000 to 224,600,000. Gas companies were supplied with a complete newspaper advertising service whereby the impact of the national drive could be localized in gas-served areas.

Promotion of the domestic or household use of gas continues to feature kitchens equipped with the automatic gas range and gas refrigerator. A separate campaign is devoted to automatic gas water heating.

In the constantly expanding use of gas fuel in heavy industry and in commerical establishments, such as hotels, restaurants and hospitals, promotion of large-volume gas sales was supported by the largest advertising expenditure to date. To bring the national promotion down to the local level, gas companies continued to be extensive users of newspaper advertising.

Promotional Activities

Promotional activities conducted during the past active year as a part of the enlarged industry plan have included the preparation of manuals on home laundries; the operation of the Commercial Cooking and New Freedom Gas Kitchen Promotional Bureaus; exhibitions in national shows; the sponsoring in promotional form of the Reference Manual of Modern Gas Service and New Freedom Gas Kitchen pamphlets. One of the most important of these steps has been the conducting of a public opinion poll on gas appliances and gas services for the purpose of guiding future promotional programs.

An enlarged program of new activities has been set up for 1947 to encompass the use of motion pictures, picture books and other methods new to the gas industry.

The New Freedom Gas Kitchen program, presenting gas in glamorous home settings, has been brought to every state in the nation. Inquiries concerning the modern, streamlined kitchens being promoted under this aggressive program, have been received from 25 foreign countries, attesting to its universal appeal. Its influence is shown in the results of a recent survey of 340 gas com-

PRELIMINARY ESTIMATES—ALL TYPES OF GAS

	1946	*1945*	*Percent change*
Consumers			
TOTAL	20,835,000	20,292,000	+2.7
Residential	19,449,000	18,996,000	+2.4
Commercial	1,283,000	1,197,000	+7.2
Industrial	89,000	85,000	+4.7
Other	14,000	14,000	—
Revenues			
TOTAL	$1,205,992,000	$1,159,478,000	+4.0
Residential	762,887,000	722,000,000	+5.7
Commercial	149,845,000	140,591,000	+6.6
Industrial	279,503,000	278,026,000	+0.5
Other	13,757,000	18,861,000	—27.1

PRELIMINARY ESTIMATES—NATURAL GAS

	1946	*1945*	*Percent change*
Consumers			
TOTAL	9,401,000	9,054,000	+3.8
Residential	8,737,000	8,443,000	+3.5
Commercial	624,000	572,000	+9.1
Industrial	35,000	34,000	+2.9
Other	5,000	5,000	—
Sales in MCF.			
TOTAL	2,192,778,000	2,179,080,000	+0.6
Residential	612,928,000	567,514,000	+8.0
Commercial	177,873,000	167,783,000	+6.0
Industrial	1,336,921,000	1,319,300,000	+1.3
Other	65,056,000	124,483,000	—47.7
Revenues			
TOTAL	$705,222,000	$682,224,000	+3.4
Residential	384,403,000	365,400,000	+5.2
Commercial	77,511,000	73,822,000	+5.0
Industrial	233,300,000	228,202,000	+2.2
Other	10,008,000	14,800,000	—32.4

PRELIMINARY ESTIMATES—MANUFACTURED GAS

	1946	*1945*	*Percent Change*
Consumers			
TOTAL	8,973,000	8,803,000	+1.9
Residential	8,394,000	8,254,000	+1.7
Commercial	532,000	504,000	+5.6
Industrial	39,000	37,000	+5.4
Other	8,000	8,000	—
Sales in MCF.			
TOTAL	412,053,000	395,483,000	+4.2
Residential	280,659,000	260,135,000	+7.9
Commercial	66,107,000	60,492,000	+9.3
Industrial	60,231,000	69,396,000	—13.2
Other	5,056,000	5,460,000	—7.4
Revenues			
TOTAL	$391,864,000	$370,939,000	+5.6
Residential	296,028,000	277,498,000	+6.7
Commercial	58,582,000	53,719,000	+9.1
Industrial	33,931,000	36,212,000	—6.3
Other	3,323,000	3,510,000	—5.3

panies which revealed a marked trend toward the sale of complete kitchens by gas companies, 91 of whom plan to sell complete units. Also significant was the fact that 138 of the reporting companies have already set up kitchen planning bureaus or plan to organize them.

One of the outstanding achievements of the year in the residential gas sales program was completion of the monumental work, "Reference Manual of Modern Gas Service," of which nearly 10,000 copies have been purchased by gas utility companies for distribution to local architects, builders and others. The manual is a complete and comprehensive handbook covering home planning, gas equipment, installation details, design factors, controls, and architects' specifications. It also includes manufacturers appliance data sheets.

Courses on residential gas salesmanship and the fundamentals of the gas industry were widely distributed among gas companies to indoctrinate general employees and to teach modern sales methods.

Supporting all this are expanded statistical and publicity services thoroughly covering all segments of the industry and reaching out beyond to the general public, the financial and business worlds and the technical professions. As a result, the story of the gas industry and its operations is being promoted on a scale far beyond anything attempted in the past.

PRELIMINARY ESTIMATES—MIXED GAS

	1946	1945	Percent Change
Consumers			
TOTAL	2,461,000	2,435,000	+1.1
Residential	2,318,000	2,299,000	+0.8
Commercial	127,000	121,000	+5.0
Industrial	15,000	14,000	+7.1
Other	1,000	1,000	—
Sales in MCF.			
TOTAL	145,832,000	140,619,000	+3.7
Residential	97,881,000	90,576,000	+8.1
Commercial	21,432,000	19,877,000	+7.8
Industrial	25,583,000	28,798,000	—11.2
Other	936,000	1,368,000	—31.6
Revenues			
TOTAL	$108,906,000	$106,315,000	+2.4
Residential	82,456,000	79,102,000	+4.2
Commercial	13,752,000	13,050,000	+5.4
Industrial	12,272,000	13,612,000	—9.8
Other	426,000	551,000	—22.7

Home Service

Major contributions to the national program of food conservation were made during the year by gas companies' home service departments throughout the country. Hundreds of home service women operating in their local communities prepared and publicized special recipes and menus to conserve wheat and other essential foods during the 1946 emergency to make food available to the hungry millions of the world. Demonstration kitchens and information centers were maintained and food preservation requests by the thousands were handled.

Tieing in with the building and modernization program of the nation's schools, the Association published a booklet, "Modern Kitchens for Homemaking Instruction" which directed attention to home economics teaching facilities in high schools and colleges. Thousands of copies of this booklet were distributed through local gas companies.

A. G. A. Laboratories

The American Gas Association's Testing Laboratories in Cleveland and Los Angeles returned to their first year of full peacetime operations extending every possible aid to manufacturers in speeding production of approved gas appliances. Testing and inspecting of new models for compliance with approved standards and checking appliances that are in production on assembly lines arose above pre-war levels at mid-year.

Reflecting the resumption of gas appliance production, testing activities increased 220 percent over last year, while factory inspections were greatly stepped up as production was resumed. The decided trend towards gas house heating was reflected in the fact that about 40 percent of test work was devoted to gas-designed central-heating equipment in addition to extensive testing of conversion burners for existing house-heating installations.

Paralleling these services, the research projects assigned to the Laboratories were likewise expanded. Activities in this field increased some 30 percent over 1945. Advances in appliance efficiency, performance and design were pioneered while kitchen ventilation studies attracted wide attention.

Industrial and Commercial Gas

Many new uses for industrial gas which were developed during the war are now in service in the processing of products made of metal and other materials. Industries using heat in their manufacturing processes, and there are few indeed which do not, have come to look to gas as the premier industrial fuel for accuracy and quality of performance as well as speed and labor saving. These factors are well exemplified in the recently designed gas furnaces, ovens and special industrial gas equipment. These include large paint drying and finishing ovens for automobile body drying, radiant gas burners for ceramic furnaces and high-speed direct flame heat-treating.

Commercial gas sales reached an all-time high during the past year, due largely to the increase in cooking in public eating places. Gas cooks more than 90 percent of the 62 million meals which are now served daily in hotels and restaurants. Some of the new models of heavy duty equipment serving this profitable market are being produced in stainless metal alloys offering longer life, more attractive appearance and ease of cleaning.

The Association continued to sponsor technical *(Continued on page 58)*

Features of 1947 Gas Refrigerator

New model refrigerator has adjustable shelves, a frozen food compartment, plus many other smart, helpful features

BY DR. R. S. TAYLOR*

Servel, Inc., Evansville, Ind.

R. S. Taylor

THE ultimate customer sets the requirements for a product. This is correct in the long pull and all new developments are directed toward this end. This is particularly true of the new 1947 "S" model gas refrigerator.

A sales and customer requirement in a gas refrigerator is attractive appearance. It should attract attention not through some freakish item like some lady's hat. Mrs. Customer must live with the refrigerator for some time, whereas she expects her association with the hat to be temporary. The refrigerator should attract attention due to an over-all ensemble effect, conservative enough to be lasting in appeal and yet rich in attractiveness.

On the exterior, this is accomplished by smooth flowing lines, easy to clean, accentuated by judicious use of bright metal and a trace of color.

In satisfying this appearance requirement, every effort has been extended to get at the same time the best compromise with the other factors, such as serviceability, utility to the customer, ease of service by the service man, adaptability to production equipment, etc.

The interior takes care of the needs and desires of Mrs. Customer. It has beauty through the use of chrome, aluminum and color. It has utility to the n-th degree through its many features, such as:

1. Large convenient vegetable fresheners of acid resisting porcelain with glass tops to show the contents.
2. Unobstructed shelves adjustable to give the most convenient spacing for any family.
3. A large tall bottle space.
4. A meat tray which can be used in the evaporator for holding frozen meats or other frozen foods or for non-freezing storage by placing elsewhere in the cabinet.
5. A large and most flexible low temperature space. As can be noted, the space is unobstructed, permitting more to be used for ice freezing and less for frozen foods or vice versa depending on the needs of a particular family.

The product has additional customer appeal in many ways, such as:

1. It is easily cleaned. The interior accessories are all easily removed leaving clear open spaces to be cleaned. The accessories in turn are easily cleaned individually. The white and curved breaker strip contributes not only to beauty, but also to easily cleaned lines.
2. Infrequent defrosting is needed. By separating the freezing compartment from the cabinet cooling coils, it is possible to keep the cabinet cooling coils at a higher temperature and thus lessen the accumulation of frost, and under the usual summer load conditions, little or no frost accumulates. The freezing compartment being separated and insulated from the normal food compartment has little contact with moisture laden air and hence builds up frost very slowly. It is also possible to defrost the cabinet cooling or high temperature evaporator without melting the contents of the freezing compartment merely by setting the thermostat at a warm setting.
3. The food compartment itself is maintained at a higher humidity than in the usual refrigerator, thus lessening the drying out of foods kept on the shelves.

Part of the many advancements in the new "S" models are reflected in direct user appeal as is the case of those mentioned, and are the result of our study of the many comments and suggestions received from various sources. Others, perhaps not visible or obvious, are nevertheless of interest. Some of the major ones of these should be mentioned. Considering the cabinets first, the following points are of special interest.

1. Increased strength has been added to partially counteract the rough handling in transportation which we now seem to be getting.
2. Formed door pans of an improved material have exhibited a freedom from objectionable warpage even when subjected to conditions designed to be the worst possible from a warpage standpoint.
3. The insulated separator and drain tray under the low temperature evaporator is of special cemented plastic construction with insulation in the space between the two plastic pieces.
4. The hinges are strong, reliable, easily adjusted and have the door stop incorporated in them.

Next let us *(Continued on page 58)*

Inside of model "S" refrigerator

New refrigerator has smooth lines

* Part of an address presented at the Midwest Gas Association's school and conference.

Laboratories Guide To Burner Design

Association's research bulletins on burner design provide a wealth of technical information for appliance manufacturers, gas company engineers and servicemen

SINCE the inception of the Domestic Gas Research program by the American Gas Association, nine specific research bulletins on burner design have been published by its Laboratories, based upon projects authorized by the Committee on Domestic Gas Research as important to the technical progress of the industry.

Gradually many of the individual factors influencing design have been technically isolated, until today it is often possible to design for specific burner characteristics in advance. These have been correlated and combined in empirical relationships, reducing them to mathematical formulas of importance to the appliance engineer and designer. A wider range of flexibility is thus permitted in attainment of satisfactory performance and adaptation to operating conditions.

Design factors associated with five principal physical parts of a gas burner —Ports, Head, Mixer, Primary Air Control and Orifice—are outlined below. Opposite each are shown specific research bulletins in which detailed information is presented, together with some of the main features covered.

PORTS

Research Bulletin No. 10

Port size requirements for various types of gases.

Comparative lifting and yellow tip limits for 29 different gases for a range of rates per sq.in. of port area.

Effect of port size on noise of extinction with small burners.

Port discharge coefficients.

Flame travel.

Minimum gas rate per port.

Research Bulletin No. 13

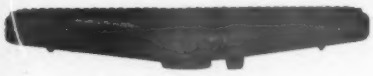
Effect of port size, depth and spacing on lifting and yellow tip limits, burner head pressure and flame heights.

Research Bulletin No. 37

Effect of port size and depth and throat to port area ratio on primary air injection.

Research Bulletin No. 38

Effect of port size, depth and spacing on flash back limit.



HEAD

Research Bulletin No. 10

Cross-sectional area requirements.

Shape of burner.

Effect of burner volume on noise of extinction with small burners.

Research Bulletin No. 16

Relation of internal volume of burner head to ignition and extinction characteristics of small burners.

Research Bulletin No. 34

Effect of air-gas mixture temperatures in burner head on flame characteristics of aerated burners.

MIXER

Research Bulletin No. 10

Comparison of rough and smooth internal finish of mixer tube with respect to primary air injection.

Optimum throat to port area ratios.

Effect of mixer tube design on noise of extinction with small burners.

General mixer tube design.

Research Bulletin No. 37

Quantitative effects of mixer tube design on primary air injection, including such factors as throat diameter, slope of venture, length of tube and tube inlet.

PRIMARY AIR CONTROL

Research Bulletin No. 10

Air shutter openings required for adequate primary air injection.

Research Bulletin No. 22

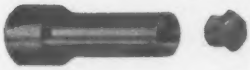
Suggested air shutter design providing protection from closure by dust and lint. Other primary air control devices, including extended orifice, double orifice, angle orifice and pressure reduction orifice.

GAS ORIFICE

Research Bulletin No. 10

Discharge coefficient of orifices.

Capacity and primary air injection characteristics of orifices, including both fixed and adjustable types.



Effect of orifice position on primary air injection.

Research Bulletin No. 22

Special type orifices for primary air control.

Research Bulletin No. 37

Effect of gas pressure and specific gravity on primary air injection.

SPECIAL BURNER

Research Bulletin No. 20

Special burners utilizing all air for combustion as primary air.

Research Bulletin No. 32

Characteristics of various non-aerated burners, including both luminous and non-luminous types.

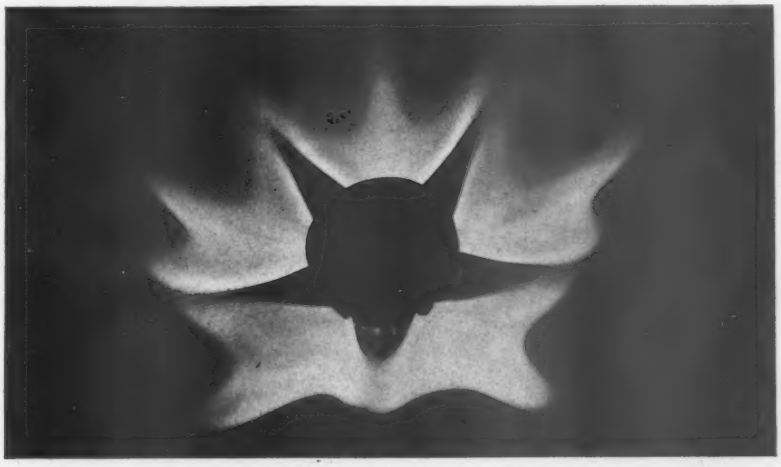
Research Bulletin No. 34

Effect of port design on gas rates obtainable with atmospheric injection of

primary air in excess of that theoretically required for complete combustion.

Research Bulletin No. 38

Flash back characteristics in relation to burners designed to inject all air for combustion as primary air.



U. S. Tests Underground Gasification

Country's first experiment to determine possibility of gasifying coal underground to be started this month

BY HAROLD B. HINTON*

A BY-PRODUCT of the suspension of the coal strike was the resumption of work on the country's first experiment in gasifying coal in the earth. The trial is to be made early in January in one corner of the Gorgas Mines, west of Jasper, Alabama.

If no unforseen difficulties are encountered, the necessary tunnels should be dug and the instruments and machinery in place, according to an estimate by Milton H. Fies, consulting engineer in charge. The Gorgas Mines belong to the Alabama Power Company.

A. C. Fieldner, chief of the Explosives and Fuel Section of the Bureau of Mines, and several of his experts are cooperating with the forthcoming trial. The technique is reported to be in industrial use in the Soviet Union, but Russian engineers either cannot or will not supply sufficient details of the subterranean reactions to give what American engineers feel are essential data.

Mr. Fies was fortunate enough to find a sort of peninsula of a coal seam, three feet thick sticking into the forest on one edge of the Gorgas Mines. By digging a trench about twenty-five feet wide across the neck of the coal isthmus, below the level of the coal seam, he was able to isolate the experimental area from the main coal bed, eliminating risk of fire spreading beyond control.

The terrain for the experiment looks rather like a gigantic test tube, which, in effect, it is. The coal seam lies about 25 feet below the surface of a little hill. This "roof" is made up of rock and shale, but contains so many faults that Mr. Fies is convinced it will collapse after a certain amount of the coal beneath it has burned.

At what would be the neck of the test tube, two tunnels, each six feet wide, are being driven into the three-foot coal seam about fifty feet apart. They will run, parallel, to a depth of 150 feet toward the bottom of the test tube. A similar tunnel will connect them at their far ends, the whole forming a U-shaped channel through the coal seam.

When everything is ready, the face of the seam will be lighted at the far end. A large blower will propel air into the channel, to accelerate combustion. A master valve will enable the air to circulate in either a clockwise or counter-clockwise direction.

At the near end of the entrance tunnels, two tanks will collect samples of the gases generated. During this experiment, no attempt will be made to utilize the resultant gases.

A series of 12 holes have been drilled down to the coal seam through the roof. Instruments will be installed in tubes placed inside these holes to record the progress of the reaction. Eight observation posts, four on each side, are to be run in from the sides with fireproof glass windows to afford visual observation of what goes on when the fire gets under way.

Experts of the Bureau of Mines have predicted to Mr. Fies that a temperature of 2,000 degrees Fahrenheit may be expected when the seam gets to burning at full blast. However, they say, the heat will be felt only about two feet above the burning seam, so that Mr. Fies hopes the roof will collapse gradually in segments without breaking through clear to the surface permitting the precious gases to escape.

The Alabama Power Company has a large steam plant for the generation of electricity about a mile from the scene of the gasification experiment. It burns coal from the Gorgas Mines in this plant. Its immediate interest in the experiment, which it is financing, is to investigate the possibility of gasifying its coal underground and piping the gas to its boilers to be burned instead of the coal now used.

The interest of the Bureau of Mines is directed more toward the by-products than the gas itself. Its fuel experts for many years have been experimenting in laboratories with the production of gasoline and other fuels from coal gas, looking to the possible exhaustion of petroleum reserves in the United States.

* Reprinted from the *New York Times*.

NATIONAL CONFERENCE OF ELECTRIC AND GAS UTILITY ACCOUNTANTS

Hotel Statler — **April 7, 8, 9**
Buffalo, N. Y. — **1947**

THE 1947 National Conference of Electric and Gas Utility Accountants offers you the opportunity to hear the latest developments in accounting technique discussed by experts . . . to learn how the other fellow is solving problems similar to your own . . . to see the newest types of accounting and business machines in action.

Subjects to appear on the program will be carefully selected to cover major topics of interest to accountants and executives, and will be introduced by outstanding authorities. More details of the program will be published following a meeting of the Program Committee, which will be held in mid-January.

An extensive exhibit of the newest accounting and business machines is being arranged in connection with the Conference, and will also be located at the Statler.

In view of the shortage of hotel space, it is urged that your reservation be made as soon as possible.

New National Advertising Plans

A background of the gas industry's highlysuccessful cooperative advertising campaign, including readership results and forward-looking plans for the coming year

BY DORR P. HARTSON*

Chairman, Committee on National Advertising

Dorr P. Hartson

AN event of far-reaching significance to the gas industry and of vital importance to every individual connected with it was the launching, in 1936, of the gas industry's national cooperative advertising program under the auspices of the American Gas Association.

Through prosperity and depression, through economic and political upheavals, climaxed by a global war, this national effort designed to maintain and increase the importance of gas fuel appliances and equipment in the American economy has gone on without pause or break.

Advertising campaigns of a cooperative nature sponsored by trade organizations unfortunately have a poor record for longevity. As a matter of fact, there were at its beginning some forebodings of the life-expectancy of the gas industry's program.

With sectional and other differences existing in the marketing problems of the gas industry, could a program be formulated which would meet the practical approval of all contributors?

Would we be able to hold to the broad vision that prompted this crusade—or would this great venture be short-lived, as so many others had been?

These were but two important problems of many that had to be faced at the outset. Financial support, then as now, was entirely voluntary, originally for periods of three years at a time. Therefore, each contributor had to be satisfied that his funds would be invested for the best interest of the gas industry and of himself.

To the lasting credit of the rank-and-file of the gas utility industry as well as to those in whose hands the responsibility of leadership was placed, one campaign after another followed until now the most comprehensive program of all is planned for the eleventh year of national advertising.

Administration of the program continues to be in the hands of competent committee personnel. The Committee of which I am chairman is responsible for the determination of advertising policies and budgeting. J. J. Quinn is Chairman of the Domestic Copy Committee, which is responsible for preparation and supervision of the domestic gas program. J. P. Leinroth is Chairman of the Committee which carries a similar responsibility for the Industrial and Commercial Gas Campaign. These underlying Committees work with advertising counsel—McCann-Erickson, of New York, for the domestic gas program and Ketchum, MacLeod & Grove, of Pittsburgh, for the industrial and commercial gas program. Charles W. Person of Association Headquarters devotes his full time to both campaigns.

J. J. Quinn

Additional funds made available through the Association's Research and Promotional Plan have enabled the Committee on National Advertising to step up its advertising to its present expanded volume. The year prior to the Plan—1943-44—the budget for national advertising was $384,000. In 1944-45, with the aid of the Plan, the program was increased to $522,000. In 1945-46, it was again increased to $872,000. For the coming year the budget will be approximately the same as for the previous year.

Summing up the program for 1945-46, the main developments were: Use of more pages in more media than ever before; continued emphasis on New Freedom Gas Kitchens in the big circulation magazines; addition of a new series in full-page size, four colors, on the four major domestic uses of gas and on the superiority of gas cooking; a greatly increased industrial and commercial campaign providing vertical coverage in important fields and larger space in others, and a contribution of $160,000 by members of Gas Appliance Manufacturers Association.

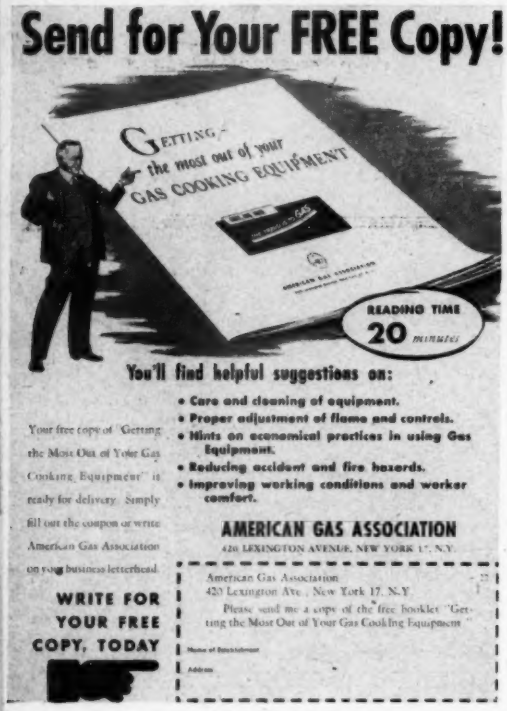
Last year's advertising utilized 83 magazines whose total circulation was 47,500,000 copies. The campaign consisted of 654 insertions—119 promoting residential gas uses and 535 devoted to industrial and commercial gas. During the year there were 208,000,000 messages on domestic gas and 7,600,000 on industrial and commercial gas—total 215,600,000.

The greatly increased figure for circulation and messages over those for 1944-45 were due principally to the addition to the media list of the two newspaper-supplements—The American Weekly and This Week. Advertising space in these two supplements was devoted to one ad each on water heating, house heating, air conditioning and refrigeration, and three ads on gas cooking, which carried the title, "Where Food is Finest, It's Cooked With Gas."

L. P. Leinroth

Four important additional fields were reached by the industrial and commercial gas advertising—Chain Store, Restaurants and Soda Fountains, Newspaper Publishers and Printers. Textile

*Equitable Gas Company, Pittsburgh, Pa.


Send for Your FREE Copy!
GETTING the most out of your GAS COOKING EQUIPMENT
READING TIME 20 minutes
You'll find helpful suggestions on:
• Care and cleaning of equipment.
• Proper adjustment of flame and controls.
• Hints on economical practices in using Gas Equipment.
• Reducing accident and fire hazards.
• Improving working conditions and worker comfort.
Your free copy of "Getting the Most Out of Your Gas Cooking Equipment" is ready for delivery. Simply fill out the coupon or write American Gas Association on your business letterhead.
AMERICAN GAS ASSOCIATION
420 LEXINGTON AVENUE, NEW YORK 17, N.Y.
American Gas Association
420 Lexington Ave., New York 17, N.Y.
Please send me a copy of the free booklet "Getting the Most Out of Your Gas Cooking Equipment."
Name of Establishment
Address
WRITE FOR YOUR FREE COPY, TODAY

A new development in national commercial gas advertising—offer of a free copy of a service booklet on commercial cooking equipment

A leading can manufacturer uses gas fuel in four essential heating jobs. Result—an effective industrial gas ad

Industry, and Technical College Students and Alumni. Better coverage of certain important fields was achieved by adding an additional publication in each of the metals and chemicals industries. Also, more impressive space units were purchased in several key publications to obtain better prestige value.

Highlights of the 1946-47 program are: A series of full-page, four-color ads on the gas range and gas refrigerator with New Freedom Gas Kitchens as main art element; launching of a separate campaign of half pages in four colors on automatic gas water heating, and an expanded program of industrial and commercial gas advertising designed to reach markets offering the greatest opportunities for load building.

Media Carefully Selected

In selecting magazines to carry domestic advertising for the new year, seven major factors served as a guide, namely, 1. Market Coverage. 2. Primary and Secondary Audiences. 3. Age and Type of Readers. 4. Economic Status. 5. Value per Advertising Dollar. 6. Competitive Advertising. 7. Editorial Support.

Other factors which cannot be stated statistically were also considered, such as a magazine's prestige and influence upon its readers resulting from long years of editorial service—the prior presence of a publication on the list and the desirability of building on the foundation laid by that prior effort.

Two newspaper supplements on the 1945-46 list, the American Weekly and This Week, are omitted from the new list. These publications were added a year ago when G.A.M.A. contributed $160,000 to the A. G. A. fund. This contribution covered a major share of the cost of using the two publications. While complete ratings are not available, it is believed that the special campaign which appeared in them did the job intended for it. Since there are no funds available from G.A.M.A. for the 1946-47 program it became necessary to make a readjustment of the list. In this process, due recognition was given to the fact that the American Weekly and This Week lacked in some important instances the degree of national coverage desired by the contributing utility companies—a situation which is remedied by using other publications, namely, Collier's, Family Circle and Woman's Day.

Companies contributing to the program are located in all sections of the country and it is therefore vital that advertising media selected have national distribution. In addition to this, it is important that media reach the urban markets which are the gas-served areas.

As to national distribution, the publications recommended for 1946-47 supply national coverage in the urban markets, which the government census designates as towns over 2,500 population. Woman's Day is distributed through Safeway and First National Stores and neither chain is completely national. However, when Woman's Day and Family Circle are combined, these two provide national coverage.

The markets for A. G. A. advertising are situated for the most part in towns of 10,000 and above or 25,000 and above. All recommended publications follow the same general relationship in percentage of distribution in these larger towns as they do in towns of over 2,500, and all give a relatively high rate of circulation in these areas. Although no one magazine can be said to have all of the desired qualifications, where one is weak another is strong, and the sum total of individual qualifications add up to a balanced whole.

National coverage and penetration of the most important markets for industrial and commercial gas is also assured by the use of media of recognized effectiveness. Only one change has been made in the list as used last year—Printing Equipment Engineer has been substituted for Editor and Publisher. Investigation revealed that in most cases the mechanical superintendent or foreman in a printing plant make definite and strong recommendations as to the type of equipment desired, and management usually goes along with such choices. Printing Equipment Engineer was therefore selected as the magazine which would bring the gas story nearer to the men who make first decisions as to choice of fuels.

"Copy Platform"

In developing the series of domestic gas advertising for 1946-47 members of the Copy Committee and Consultants voted on a check-list of thirteen facts

to serve as a guide in the preparation of a "copy platform." Agreement on the facts submitted ranged from eighty to one hundred percent and thus revealed a strong unanimity of opinion on main objectives, degree of emphasis to be placed on the four major domestic uses of gas, copy and layout treatments and other details.

The copy and art platform for the new consumer ads is as follows:

Main art element will be four-color kitchen, practical, efficient, modern, advanced in design, with latest convenience and decorative features to give it a livable and "lived-in" appearance. All designs to be pre-tested with 60 to 100 homemakers in the middle-income class.

Main illustration will include range, refrigerator, and water heater (represented by sink or dishwasher). Pictorial emphasis to be on refrigerator in one ad and on gas ranges in three ads. Supporting art, also in four colors, will feature range or refrigerator in lower half of ad. All layouts will be planned to increase pictorial emphasis on featured appliances. Blue Flame insigne will be used in connection with slogan.

Picture caption will stress work-saving convenience with following four essentials: Modern range, refrigerator, water heater, new system of ventilation for cooler, cleaner kitchens. Headlines to catch woman's eye and mind with promise of new, exciting, work-saving, time-saving kitchens, linking kitchen picture to appliance story.

Appliance copy will give telegraphic newslike approach to dramatic features. Short, fast, factual copy to give "just-off-the-press" impression and do hard, competitive selling job. Copy on gas ranges will carry advice to "look for this CP seal on any make gas range before you buy."

The copy and art platform for the ads on automatic gas water heating which will appear first in March 1947 follows:

Main art element will alternately depict modern, efficient bathrooms, laundries and kitchens, with smart decorative treatment plus latest time-saving inventions. Pictures in both kitchen and water heater campaigns to be rendered by same artist, thus assuring family resemblance.

Supporting art per ad will show other two of three major uses of hot water. Headline will dramatize importance of hot water in actual operation of whatever is shown in main illustration. Main copy will stress essentiality of water heater if bathroom, laundry or kitchen is to be truly modern, truly efficient. Emphasis will be on speed of recovery, economy of use. Supporting copy in short picture captions will make apt references to use of hot water in other two rooms. Slogan will be "Gas—the last word in automatic water-heating."

Appropriate committees of the Association's Industrial and Commercial Gas Section have carefully studied and analyzed their advertising plans for the new year. Copy and art platforms will continue to follow lines demonstrated to have been successful in the past but an increasing number of ads will be built on basis case history material, as has been the trend during the last two years.

The January-February national ad features the 1947 gas refrigerator. Right, the March-April ad carries a strong selling story on the modern automatic gas range with the "CP" pedigree

In connection with the development of the above platform, members of the Managing Committee were asked to list in order of importance the markets which should be reached. Industrial ratings were: 1. Metals; 2. Bakers; 3. Food Processing; 4. Ceramics; 5. Glass; 6. Chemicals; 7. Textiles; 8. Newspapers.

Commercial ratings were: 1. Restaurants; 2. Hotels; 3. Hospitals; 4. Schools; 5. Chain Stores; 6. Institution.

The order in which industrial markets are listed varies only slightly from those covered in the 1945-46 program. In commercial markets, the order is almost identical with last year.

Plans are well developed for offering free copies of service literature to readers of ads. Featured in November 1946 ads in hotel, restaurant, school and institution magazines is an offer of "Getting the Most Out of Your Gas Cooking Equipment." A booklet for industrial users is being planned. Newspaper mats, reprints and monthly issues of "Preprints" will be continued.

An analysis of readership results of domestic gas advertising for the first six months of 1946, based on reports by Daniel Starch and Staff, are highly gratifying.

During this period, advertising of New Freedom Gas (Ladies' Home Journal, McCall's, Woman's Home Companion and Good Housekeeping) and the three princpal electric appliance manufacturers, indicated by the letters A, B and C, also used space.

A. G. A. received higher observation by women than any of the three, higher thorough text reading by women than A and B, and considerably higher than C. In comparing A. G. A. ads with all range and household equipment insertions, A. G. A. purchased both observation and thorough text reading at approximately the same cost per 1,000 readers as A.

A. G. A. purchased observation at lower cost than B and C, and thorough text reading at a lower cost than B and C.

During 1945, 180 pages of four-color household equipment insertions of various manufacturers appeared in the women's magazines mentioned above.

A. G. A. advertising was above average for both observation and thorough text reading by women compared with the household equipment averages. During 1945, there were 1,030 pages of four-color insertions, regardless of product, in the four magazines. A. G. A. advertisements were rated above average for both observation and thorough text reading, as compared to all products.

Early reports indicate that the advertisement entitled "Short Cuts to New Freedom," appearing July-September, 1946, had received the highest readership ratings to date.

Comparing last year's program with the new program in terms of scope and impact, we have the following summary: Total circulation of magazines and trade papers used last year was 47,500,000. In the new program this is stepped up to 57,000,000. A total of 215,600,000 impressions or messages was obtained last year whereas the new campaign will run this up to 224,600,000.

Despite the fact that the new program is the most comprehensive planned to date, it is well to keep in mind that competition also continues to be a large and consistent user of all forms of advertising media. When one analyzes the combined volume of national magazine advertising done by the Association and the manufacturers of gas appliances and compares it with the advertising of competition—gas range vs. electric range, gas refrigerator vs. electric refrigerator, etc.—he comes face to face with the fact that we are being outadvertised and outpromoted through the most powerful opinion-forming publications in America. However, there is some real justification for encouragement in a larger volume of late 1946 advertising to be published by gas appliance manufacturers.

An analysis of gas range versus electric range advertising in national magazines for the first six months of 1946 shows that the electric manufacturers spent $499,816 as against $277,310 by the gas manufacturers, or a ratio of almost 2 to 1.

During the first quarter of 1946, the gas range manufacturers spent $58,615 which shows that the second quarter expenditures were increased materially —an encouraging development.

In the household refrigerator field, electric manufacturers have always been large purchasers of magazine advertising space and they still continue to be. For the first six months of 1946 they spent $950,394, as against $165,195 by the sole manufacturer of the gas refrigerator, or *(Continued on page 58)*

No More Stoves For Sale!

● It's not a "stove" anymore—it's a "range."

We folks in the gas industry have come a long way.

For instance there was a time when we sold gas. We made it—we piped it—we metered it—and charged for it.

Then we got religion—or rather we bumped head-on into what the experts now call "public relations."

That was the time that our first big change came.

We stopped selling "gas" as such. We stopped thinking of our great industry in terms of tanks, pumps and pipes with meters thrown in (the last named being the device which made our public wake up and shake us into these "public relations").

Now the gas industry sells a service. Today it is the most complete service in existence for the home. It provides a heating service—a hot water service—a refrigeration service—an air conditioning service—and NOW, not just a cook stove but a cooking service by way of the Automatic Gas Range.

Note that word range—it is emphasized and we in the gas industry had better make more than just a mental note of that word.

Today's marvelous automatic gas range certainly qualifies to be called a range—not a stove.

You as a buyer would willingly pay more for a range than you would for a stove. And so would your customers.

So, let's make it a rule—one that is emphasized by a typed or printed memo to every employee in our companies that from now on we shall never say "stove"—say and sell ranges.

Certainly we can show that much respect for our own merchandise. And it's more than just showing respect—it's good, sound sales psychology.

So, it's a range from now on in—we have no more stoves for sale!

—E. Carl Sorby, November *Roper Ranger*

Home service can render assistance by promoting water heating in schools, meetings and displays

Water Heater Promotion

BY W. J. SCHMIDT

Long Island Lighting Co., Mineola, L. I.

IN the past, home service activities have been devoted almost exclusively to promoting the cooking load as the backbone of our industry. While we all realize the necessity for retaining the cooking load, it has been generally proven that 1200 cu.ft. per month is a fair estimate of the consumption which can be expected from a gas range with average use. The advent of precooked, frozen, dehydrated and other processed foods will vitally affect this cooking load because the housewives of America will be required to spend less time at the kitchen range than ever before.

The publication *Frosted Food Field* September 1946 issue contains the following article, "A popular package for the apartment dweller is the twenty-minute dinner, featuring a meat, two vegetables and a dessert frozen on one platter. It caters to the small family of one or two, sometimes three, who find it much easier and tastier to serve a meal already apportioned and frozen, than to prepare one from cans or by other methods. It takes less time and energy. It is the opinion of one of the officers of the corporation that frozen foods will in time replace canned goods. These twenty-minute dinners have five different menus from which to choose and they sell for an average of 85 cents." Result—still lower consumption from gas range use! This will necessitate continuation of active promotion of gas cooking by home service personnel and their ingenuity will be severely taxed if we are to retain the cooking load or even a substantial part of it.

Home service activities in past years have been too intensely concentrated on the cooking target *alone*. At least this is true to a large extent! To illustrate my point, may I direct your attention to the two articles in the September issue of *Servel News* reporting the activities of a large eastern gas company and a west coast company.

Pictures of these gatherings fail to disclose a gas water heater on the demonstration platform and I was unable to detect any mention of hot water in the text. These activities are typical of what we have been doing for a number of years in the gas industry and were selected by me as the only typical examples available at the moment. I trust the companies involved will not consider my reference to them as a specific criticism because the entire industry is equally at fault. My remarks should rather be considered as constructive suggestions since that is the spirit and intent of this discussion.

No meal has ever been prepared and served without the necessity of cleaning up the kitchen, that disagreeable task which is universally distasteful to housewives and which always provides the terrible anti-climax to an otherwise delightful occasion. Even if paper dishes are used, there are still those ever present pots and pans which cannot be thrown away but whose rejuvenation is

A three-dimensional display in The Brooklyn Union Gas Company's main window. The effect of falling water was achieved by the agitation of cellophane strips

Presented at 28th Annual Convention, American Gas Association, Atlantic City, N. J., October 7-11.

greatly aided by plenty of real hot water. Thousands of women who attend these cooking demonstrations can be told the automatic gas water heater story and home service should never let such opportunities escape.

It is apparent that we have been hunting with a single barrel shot gun when we could have used a high-powered double barrel shooting iron and sighted the water heater target at the same time we were firing at the cooking bullseye. In the basement, we should have an appliance which averages 3600 to 5000 cu.ft. per month, namely the automatic storage gas water heater. The opportunity has always been with us but, as I have already said, we have figuratively missed the boat because we have rushed from the kitchen by the nearest exit instead of going down the basement steps and doing a bit of active promoting and demonstrating in the nether regions of the home. The saturation of automatic gas storage water heaters on the mains of most companies is so low we should hang our heads in shame.

It is estimated there are still 11½ million homes without water heaters. At a rate of 75 cents per mcf, a fair average of costs for domestic water heating service, using an automatic gas storage water heater on manufactured gas, would be $3.00 per month. Simple mathematics immediately reveal possible gross revenues of $34,500,000 per month or $414,000,000 per year. That, folks, is big business in any field! While we cannot expect 100 percent saturation on anything, we should be able to sell 10 percent of this market within a reasonable period! That small portion of the total melon would give our industry $41,400,000 additional gross revenues per year! When we take into consideration the almost certain increased use of existing gas water heaters to provide hot water for automatic laundry and dishwashing machines this pot of gold grows even larger! What else have we to sell which offers such great return?

Our opportunities have now been greatly amplified by the introduction of the automatic electric washing machine and the electric dishwasher sink unit. These appliances, presently, in terrific demand, while sold by agencies outside the gas industry, require plenty of hot water and the hot water load represents the most profitable business for which the gas company could hope. Monday was once considered "wash day" but users of automatic washers average six nine-pound loads per week. Any day in the week can now be classed with the old fashioned Monday. I strongly recommend that every home service representative read and study the article entitled "Hot Water for the Automatic Washer" which appeared in the A. G. A. MONTHLY, combined issue for July and August 1946.

Estimates of the amount of hot water required by these electric washing machines vary from 15 to 18 gallons of 140 to 160 degree water per cycle downward to a minimum of 10 gallons per cycle. The time of a cycle varies from 30 to 45 minutes.

One manufacturer advertises as follows: "Requires only 10 gallons of hot water for a *full* load; *less* for a partial load. Washes cleaner than any other household washer, regardless of type. Has no electrical timer, no electrical

In bathroom, kitchen, laundry, too
As all good housewives know
This magic flame gets great acclaim
for heating H_2O.
IF DAD GROWLS through a cold-water shave because the laundry used up all the hot water... if washing dishes means postponing a bath... this message is definitely for you. You can have all the hot water you want when you want it with an automatic gas water heater of the right size. No running short. No purple tempers. There'll be plenty for every need. Plenty to spare, even for the new automatic dishwashers and automatic washing machines that use so much.
You'll save more than tempers and time, too. You'll save money. For when you have an adequately-sized automatic gas water heater, it won't be overworked; will actually last longer. For long range economy... for a dependable supply of hot water galore ... see the flame-perfect gas water heaters at your dealer's or merchant plumber's.
Check Your Family's Minimum Hot Water Requirements
STORAGE-TANK CAPACITY GUIDE
Number Bathrooms
Number Bedrooms
Storage Cap. Gallons
1 | 1 or 2 | 30
1 | 3 or 4 | 40
2 | 2 or 3 | 40
2 | 4 or 5 | 50
3 | 3 | 50
3 or 4 | 4 or 5 | 75
Approved by Pacific Coast Gas Association
SOUTHERN CALIFORNIA GAS COMPANY
SOUTHERN COUNTIES GAS COMPANY
Plenty of Hot Water with GAS

Cartoons carry the gas water heating message in this effective Southern California gas series

This Brooklyn Union ad uses an ingenious approach to the hot water problem

solenoids, no complicated gadgets to give trouble. Can be used in homes having no hot water heater." The president of this manufacturing company expects that this feature of his machine will open the market to the 11½ million homes without water heaters. Then we read about the manufacturer who claims his machine will wash six full tubs of laundry in less than one hour!

To further substantiate his reasons for buying his machine this manufacturer glibly advertises "saves hot water and soap and actually uses less water than a conventional washer. No special water heater is needed. Requires no special soaps or chemicals."

"Fast, clean, effortless washings. What every housewife wants! Here at last is a washer that washes all garments—from grimy work and playclothes to daintiest pieces—really clean!" Despite these glowing claims, I am sure any of these washing machine manufacturers would welcome the assistance of an approved automatic storage gas water heater, furnishing plenty of real hot water, in the homes where they sell their products. If they perform so well without a water heater what miracles could they perform with one?

It must be done with mirrors or perhaps they have already discovered a new practical use for atomic energy since dirty clothes and hot water have always been bitter enemies. Such advertising is an indication of what we can expect from some quarters and we must leave no stone unturned if we are to keep our heads above water in the swim for our share of the consumers' dollar! To indicate what a struggle against the tide that swim for our share of the consumers' dollar will be I quote a few figures from a recent survey by a leading national magazine. Those interviewed expressed the following intentions, during the first year of peace and normal production:

24.5% stated they would buy an electric range
18.6% stated they would buy a gas range
15.4% stated they would buy an electric water heater
14.5% stated they would buy a gas water heater
47.7% stated they would buy an electric washing machine
17.4% stated they would buy an electric dishwasher

These figures show the trend of public preference and the necessity for aggressive promotion and advertising if we are to maintain our position in the cooking and water heating fields. When we consider the millions which will be spent for automobiles, radios, furniture, etc., our task assumes mountainous proportions!

The water heating business provides the greatest contribution to net revenues (and I do not exclude house heating and refrigeration business). Any financial executive in our industry will attest to the importance of net revenue! It is his Bible, and incidentally it represents the goose which lays our golden eggs, those salary checks to which we all look forward and which are so, so necessary! Our home service personnel by active cooperation in promoting the water heating load can fatten this goose. Perhaps it will then provide bigger and better golden eggs.

I have had the good fortune to work actively on the Association's Water Heating Committee for the past three years and our first attempt to solicit the energetic support of home service personnel took shape in the Home Service Essay Contest on the subject "What Can Home Service Do To Aggressively Promote Adequate Gas Water Heating Service?" This contest produced some fine papers on the importance of hot water in the home but less than 100 girls entered, which is an extremely small percentage of the total home service personnel of the industry.

We should have more interest than that in any contest; particularly, one dealing with such a vital topic and a competition which offered very lucrative rewards for the winners. It is quite possible the blame for such apparent disinterest can be placed squarely on the doorstep of management.

However, we can forget past performances, good and bad, and be grateful for the progress which has been made toward increasing the water heating load. Wartime conditions, fuel rationing, equipment shortages and sober reflection increased the demand for gas water heaters to a point where the supply on hand is totally inadequate to fill the orders which are literally raining from the heavens every day. The position of our industry has never been so favorable as it is today. Public acceptance of automatic gas water heating is

A few cents a day keeps the whole family in HOT WATER
They're Streamlined Beauties!
NEW AUTOMATIC GAS WATER HEATERS
IMMEDIATE DELIVERY! see your Plumber or Gas Appliance Dealer
PORTLAND GAS & COKE COMPANY

The economy theme is another strong gas water heating business getter

at a new high and our equipment is presently the only medium which can satisfactorily supply sufficient hot water for automatic electric washing machines as rapidly and as hot as necessary to produce good clean laundry! Every effort is being made to solidify our favorable position by requesting manufacturers to improve the performance of their water heaters and put us further into the lead over our competitors for this valuable business.

It is my firm belief home service can render valuable assistance by actively promoting the sale of automatic gas water heating in the following ten ways:

1. Keep the subject before all group meetings of any nature.
2. Tell the hot water story at all cooking schools.
3. Display an automatic storage gas water heater on the demonstration platform even if it cannot be connected. It is an attractive appliance and won't mar the appearance of your beautiful New Freedom kitchen.
4. Educate all washing machine dealers in your territory to appreciate the benefits from increased customer satisfaction which they will derive by joining an approved automatic storage gas water heater with their pet clothes washer.
5. Use the booklet "Hot Water Magic." Favorable endorsements are pouring in from every state in the Union. Dealer contact representatives, executives, home service directors of many gas companies have definite plans to use this booklet in promoting the gas water heater and they are backing up their testimonial letters with hard cash by placing orders for thousands of these booklets for consumer use. Discuss it with every customer at whose home you demonstrate a washing machine. Straight gas company employees should perform this service for washing machine dealers. Leave a copy of the booklet with the customer and check her method of supplying hot water in her household. If the existing method is inadequate, or the equipment does not appear suitable, turn in the name as a prospect to your sales department. Remember, the gas company collects at least five times as much revenue for gas to supply hot water service for a washing machine or dishwasher as the electric company collects for current necessary to operate the electric motor!
6. Familiarize yourself and your staff with the water heater sizing chart in the Reference Manual of Modern Gas Service. It is simple and easily understandable and will enable you to give intelligent answers to customers' questions when you are discussing automatic gas water heating with housewives who need a water heater.
7. If your company has a promotional rate for gas water heating (and if they don't, they should have), explain the advantages of that rate over the regular household tariff. Many customers still think automatic gas water heating service is prohibitive in cost but we know and can prove it is, actually, less expensive than makeshift and competitive methods in most instances.
8. Explain the advantages of the automatically gas heated water supply in every home—from basement to attic—as a beauty aid, for household duties, emergencies caused by illness and increased personal comforts.
9. Keep abreast of new developments in water heating equipment—they are on the way—consult your sales department executives.
10. Make it a point to familiarize yourself with all materials on gas water heating issued regularly by the A. G. A. Promotional Bureau.

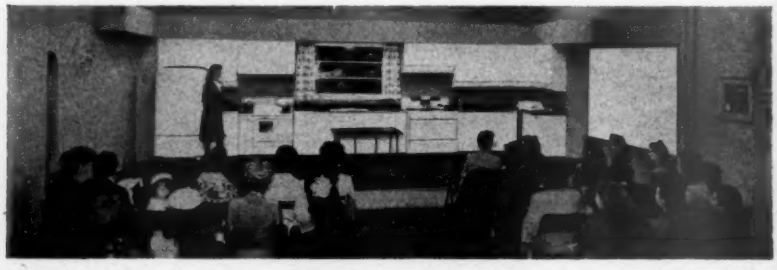
There are many other ways which time will not permit me to enumerate in which you can assist promotion of automatic storage gas water heaters.

I appreciate the opportunity afforded me on your program today to discuss this extremely important subject with you and trust my remarks and suggestions may provide the springboard which will enable home service personnel to execute a perfect swan dive deep into that ocean of gas heated water, automatically provided, by the perfect fuel and come up with clusters of natural pearls represented by increased gas bills!

Officials inspecting one of the modern gas ranges on display on the new sales floor

Key Figures in Equitable Gas Company's New Gas Appliance Sales Center

Left to right: Raymond Little, general sales manager; Paul W. Craig, manager of commercial and industrial sales; C. L. Gollings, office manager; Leon S. Maehling, manager of heating sales; H. C. Givan, sales promotion manager, and D. E. Brashear, merchandise manager



Auditorium in Equitable's new facilities seats 70. Other pictures and complete story on the opening ceremony appeared in the December MONTHLY

Gas Enrichment Oils

Analysis of oil requirements for manufactured and mixed gas utilities with authoritative information on quantities available and what quality of oil will be provided

BY A. J. McINTOSH AND E. B. DELGASS

Socony-Vacuum Oil Co., Inc., New York, N. Y.

WE are going to present our ideas of the future of gas enrichment oils in two parts. The first part will deal with quantities and the second main topic will be qualities. We will try to answer the questions of how much gas-oil may be required, whether those quantities will be available and what kind of oil will be provided.

In any forecast it is always best to look back at the history of the subject. We are presenting in Table 1, the reported consumption of light gas-oils and heavy gas-oils in the important consuming states and areas in the United States for the years 1935—1944, and in total for the year 1945. The details are not available for 1945. This table indicates clearly that over half of the gas enrichment oils in the United States are used in the North Atlantic States from New Jersey to Maine. Another important area for light oils has been in the East North Central States and there is a fairly substantial heavy oil market out in Washington and Oregon. The other markets are confined almost entirely to states from Pennsylvania south.

No Change in Decade

The history of these uses shows that there has been practically no change in the consumption of light gas-oil in the United States over the last 10 years. During the latter part of the 1930's the consumption of light oil dropped but the loss has been made up since that time. The continued and sizable growth of heavy gas-oil contrasts sharply with the lack of growth in the light gas-oil market. These trends have been prepared in three graphs. As you can see from Figure 1 the state of New York is the most important market for gas enrichment oils. The general trends indicated for the United States are reflected in this state. In the New England market the graph indicates a much larger portion of light oils used whereas in New York and Pennsylvania the light oils have been relatively smaller and their growth moderate. As illustrated in Figure 2 the market in Oregon and Washington has been almost entirely heavy gas-oils which is the exact reverse of the next group of states called the East North Central group where the heavy oil market has been negligible.

From any mathematical analysis of trends of gas consumption or population curves you would expect a steady growth in the use of gas-oils in the future and from the analysis just presented, that most of this growth would appear in the heavy gas-oil column. It is doubtful however that the rate of growth will continue as sharply upward as has been the case in the last 10 years. It must be recalled that the rate of general business activity during these early years of 1935 through 1939 as measured by the Federal Reserve Board Production Index averages 100 but the present index is about 180 and it reached a high during 1943 of 239. That part of the gas consumption which is used by industry shows a fairly consistent correlation with the F.R.B. index but there is a growth factor not contingent upon general business.

The industrial use of gas has been

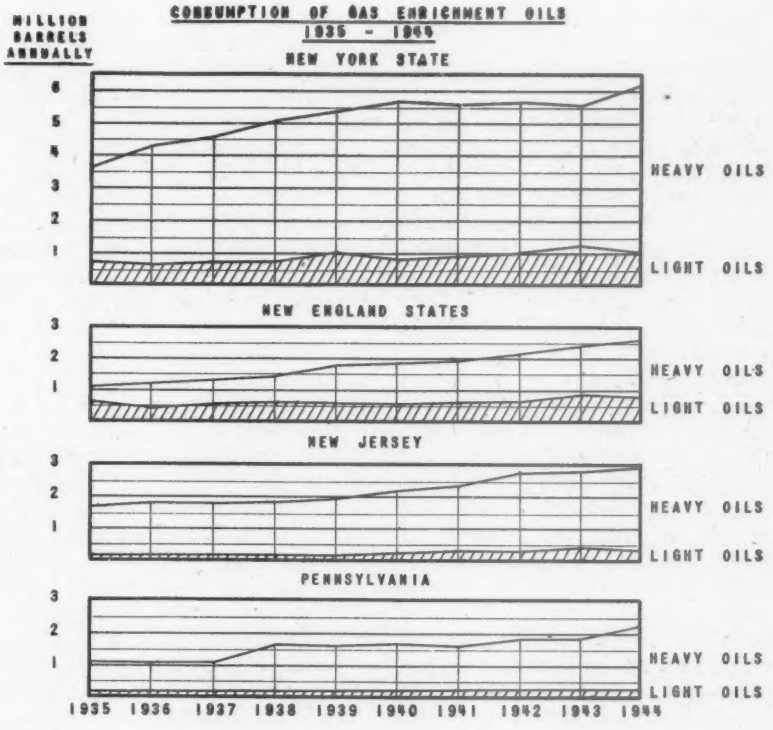


Figure 1

Presented at the 28th Annual Convention of American Gas Association, Atlantic City, N. J., October 7-11.

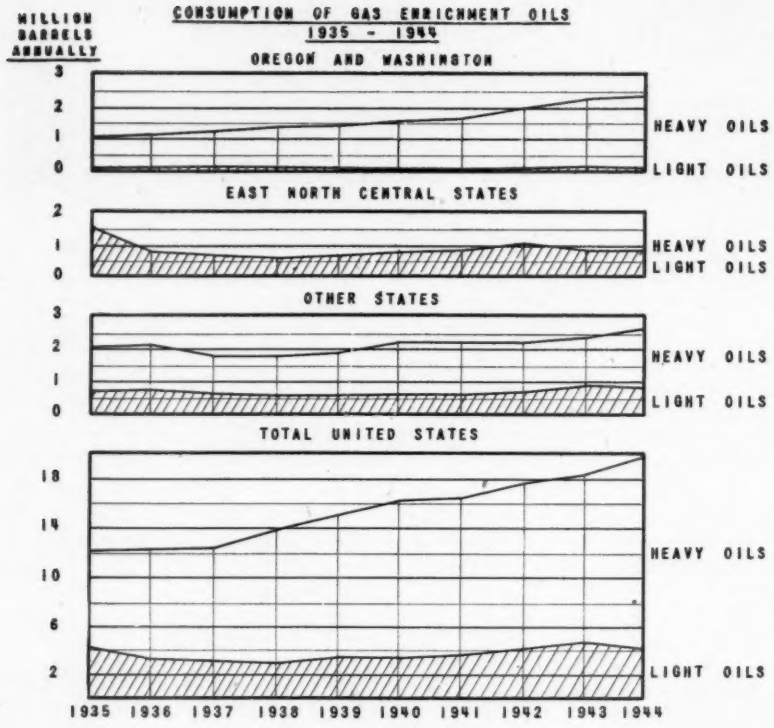


Figure 2

helped materially by the expansion in general business activity. In our opinion the F.R.B. production index over the next five years will decline slightly from its present level. From that angle therefore we would not expect the industrial use of gas to show a rapid growth over the next few years and there might be some years when it would decline.

The growth of gas for domestic use should increase consistently, following in general the increasing trend of the number of families in the United States but at a faster rate than the family increase. Weighing these things together it would appear that the gas industry volume of business should increase over the next few years but at a lower rate than it has over the last decade and that your industry would be looking for proportionately greater quantities of gas-oils to meet these increased demands, particularly the heavy gas-oils.

The question arises next whether the petroleum industry is going to be able to supply this increased market. In order to study this problem we thought it best to show what proportion of the various petroleum products is utilized by the manufactured gas industry and for this purpose we have another table showing these figures and have illustrated the final results on Figure 3, and Table 2. As can be seen from this, the light gas-oil represents only about two percent of all the light fuel oils sold to all kinds of users of this group of products by the petroleum industry.

In the early years it represented a somewhat higher percentage but as mentioned before the total volumes have not grown while at the same time the industry has met an increase in demand of 120 million barrels from other uses, principally home oil burners but also including a very large growth for the users of diesel engines. When the light gas-oil market has been only about two percent of the total of all these kinds of products, it would seem that from a volumetric standpoint the industry should not have any serious problem in supplying these relatively small quantities. Even compared with the diesel market alone, light gas-oil is small, being about seven percent.

The diesel users are most likely the closest competitors of the light gas-oil users but this material also competes with gas turbine oils and with the refiner who needs it as a cracking stock to produce other premium products such as high octane gasoline. Diesel users have been constantly presenting their ideas to the petroleum industry to try to secure what we would term premium quality diesel oils in very large quantities.

There is a problem in meeting these diesel qualities as well as those requested for light gas oils, but when the quantities of light gas-oils are only in the order of two percent of the total product, there are few who would say that such volumes could not be met as long as the proper prices were arrived at to insure that the quality required did not interfere with the production of other oils. During the next five years the petroleum industry is looking forward to an increase of over 35 percent in burner oils and a very much larger increase in diesel oils. It is sure it can meet these increased demands including the light gas-oils but the competition from diesel users is bound to increase.

Looking at the heavy gas enrichment oils as compared with all uses of similar products, we find here that they are now about 3.3 percent of the market for residual fuel oils and that they have not changed much over the last 10 years although their rate of growth has been substantial. The heavy gas-oil market as shown on previous graphs has increased from eight million to 16 million between the years 1935-1945 or an increase of eight million barrels. At the same time all other users of heavy

Who Am I?

● I am the fountain from which all blessings flow. Life has more savor because of me. I am the sole support of the poor, and those who think they can do without me live futile lives. I have made America. I have built her huge industries, laid her miles of railroads, created her cities and constructed her skyscrapers. I am represented in every newspaper that comes off the press, in every loaf that comes out of the oven, in every ship that sails the seas. Fools do not like me, while wise men do. The man who keeps his hand in mine throughout his life never dies —because that which we create lives on after he is gone. Who am I? I am WORK!

—Gas Service

fuel oils increased their requirements by 211 million barrels. We cannot see therefore that even in the case of heavy gas enrichment oils that the industry would have any serious problem in trying to meet requirements of this relatively small portion of their total heavy fuel oil requirements.

A lot of these heavy gas-oils are of the same general type as bunker oils. Some however are of a premium quality made from straight run operations and have historically sold at a price differential over ordinary "run of the mill" heavy fuel oils. We do not know how much total straight run residual fuel oil is made nor the portion used by the manufactured gas industry but it must be relatively higher than the three percent of all residuals. We would believe that if the proper differentials are set in the future that there should not be any serious problem in the petroleum industry to meet these demands. The industry does not look forward to supplying any large increases for the combined demands by other users of heavy fuel oils.

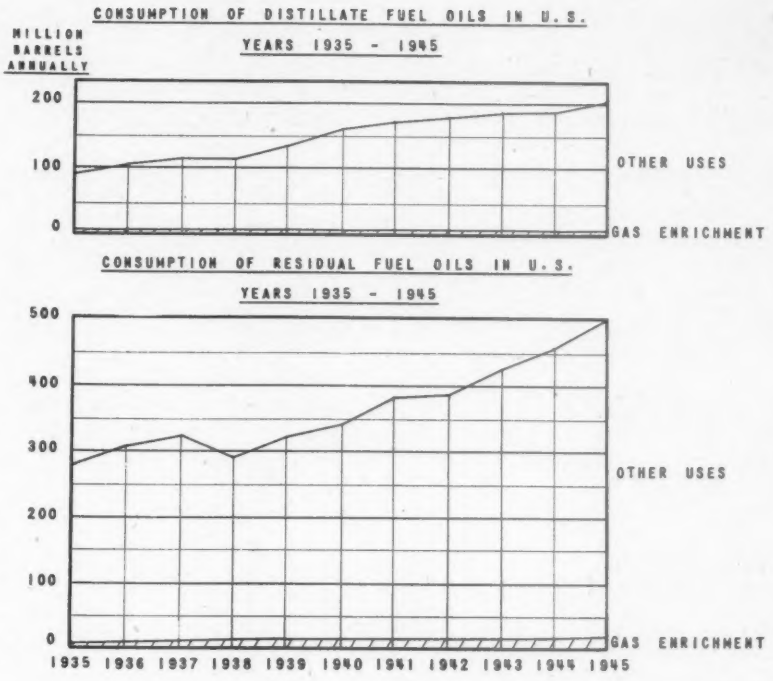


Figure 3

There are two important things which may retard the manufactured gas industry and the use of gas enrichment oils. First is the very rapid expansion in the use of liquefied gases by companies who have in the past taken care of all of their demands by manufactured gases. Many small obsolete and inefficient gas manufacturing plants are being eliminated and a mixture of air and vaporized liquefied gas put in the mains in place of manufactured gas. This will tend to reduce the demand for light gas-oils. In the case of large gas manufacturers, rather than to expand their plants to take care of short period peak loads, liquefied petroleum gases are being used to augment manufactured gases during such periods. This therefore may also slow up the use of gas enrichment oils.

There is another very important thing that may happen and that is that one or both of the War Emergency pipe lines may be used for the transmission of natural gas into the New York-Philadelphia area. As you all know, there have been several bids for these lines and the government has said that they were going to favor those bidders who would use those lines in the transmission of oil. Whether such a deal can be worked out, the writer would not know at this time. However, there has appeared an article in trade magazines recently that one of the bidders for these pipe lines is going to try to get permission to build a pipe line for gas in case they do not get the present pipe lines for natural gas use. It has been stated that they figured on supplying all of the big gas companies in Philadelphia, New Jersey and New York area.

This is a tremendous market and if this market were to be supplied by natural gas we believe that it would eliminate practically all of the use of gas-oils in these plants. There are five large companies in these areas and they use about 800,000 barrels of light gas oil and almost nine million barrels of heavy gas-oils. The pipe line as designed is estimated to carry 320 million cu.ft. of gas per day or 116 billion cu.ft. a year. This would be high B.t.u. gas. The five big companies manufacture or purchase about 155 billion cu.ft. a year of 530 B.t.u. gas.

This pipe line therefore could supply enough B.t.u.'s a year to eliminate the use of oil for enrichment except for peak loads. It would not however replace gas made from coal or coke. If therefore a pipe line were used for natural gas or a pipe line was built for the same purpose about half the market in the United States for gas enrichment oils would be eliminated. Practically all of the heavy gas-oils in New York, New Jersey and Pennsylvania would be replaced as well as about half of the light gas-oils in these same states. This pipe line project, of course, is speculative but if it does happen, any concern that the manufactured gas industry might have over the supply of gas enrichment oils would be practically wiped out overnight.

Summarizing the outlook for the future for the requirements of gas enrichment oils we think there will be a steady growth in this market at a much lower rate than there has been over the last 10 years because of the reversal in the trend of business activity, the replacement of some of the expanding market by liquefied petroleum gas and that both of these trends could be seriously interrupted if natural gas is piped into the Philadelphia-New York metropolitan market. There is every indication that because of the relatively small part that these gas-oils play in the market for all similar petroleum products that the petroleum industry will not have any trouble in supplying sufficient

TABLE 1

CONSUMPTION OF LIGHT AND HEAVY GAS ENRICHMENT OILS USED IN MANUFACTURED GAS INDUSTRY
YEARS 1935–1945

(Thousand Barrels 42 Gallons)

Year	New York					New England States					New Jersey				
	Lt. Gas Oil		Hy. Gas Oil		Total	Lt. Gas Oil		Hy. Gas Oil		Total	Lt. Gas Oil		Hy. Gas Oil		Total
	Barrels	% of U. S.	Barrels	% of U. S.	Barrels	Barrels	% of U. S.	Barrels	% of U. S.	Barrels	Barrels	% of U. S.	Barrels	% of U. S.	Barrels
1935	731	18	2,944	37	3,675	668	16	412	5	1,080	208	5	1,530	19	1,738
1936	716	22	3,560	39	4,276	455	14	725	8	1,180	205	6	1,590	18	1,795
1937	760	24	3,780	40	4,540	523	17	837	9	1,360	205	6	1,584	17	1,789
1938	760	25	4,299	40	5,059	599	19	878	8	1,477	190	6	1,648	15	1,838
1939	1,024	30	4,414	39	5,438	571	17	1,187	10	1,758	219	7	1,773	15	1,992
1940	868	25	4,830	38	5,698	526	15	1,322	10	1,848	285	8	1,897	15	2,182
1941	946	26	4,670	36	5,616	636	17	1,346	11	1,982	298	8	2,124	17	2,422
1942	1,009	25	4,698	34	5,707	687	16	1,499	11	2,186	326	8	2,458	18	2,784
1943	1,248	27	4,309	32	5,557	875	18	1,599	12	2,474	471	10	2,341	17	2,812
1944	1,005	25	5,195	33	6,200	807	20	1,793	11	2,600	375	9	2,613	16	2,988
1945	Not Available														

Year	Pennsylvania					Washington and Oregon					E. North Central States Ill., Ind., Mich., Ohio, Wisc.				
	Lt. Gas Oil		Hy. Gas Oil			Lt. Gas Oil		Hy. Gas Oil			Lt. Gas Oil		Hy. Gas Oil		
	Barrels	% of U. S.	Barrels	% of U. S.	Total Barrels	Barrels	% of U. S.	Barrels	% of U. S.	Total Barrels	Barrels	% of U. S.	Barrels	% of U. S.	Total Barrels
1935	213	5	850	11	1,063	61	1	974	12	1,035	1,525	37	12	—	1,537
1936	213	7	813	9	1,026	61	2	1,044	11	1,105	812	25	1	—	813
1937	205	7	835	9	1,040	90	3	1,170	12	1,260	715	23	1	—	716
1938	205	7	1,456	13	1,661	72	2	1,332	12	1,404	660	22	2	—	662
1939	202	6	1,462	13	1,664	24	1	1,441	12	1,465	732	22	30	—	762
1940	232	7	1,500	12	1,732	21	1	1,546	12	1,567	847	25	12	—	859
1941	256	7	1,433	11	1,689	18	—	1,634	13	1,652	883	24	7	—	890
1942	262	6	1,621	12	1,883	23	1	1,979	14	2,002	1,057	26	5	—	1,062
1943	279	6	1,588	12	1,867	76	2	2,249	16	2,325	844	18	8	—	852
1944	262	6	1,992	13	2,254	33	1	2,345	15	2,378	773	19	74	—	847
1945	Not Available														

Year	Other States					Total United States				
	Lt. Gas Oil		Hy. Gas Oil			Lt. Gas Oil		Hy. Gas Oil		
	Barrels	% of U. S.	Barrels	% of U. S.	Total Barrels	Barrels	% of U. S.	Barrels	% of U. S.	Total Barrels
1935	751	18	1,278	16	2,029	4,156	100	8,001	100	12,157
1936	760	24	1,359	15	2,119	3,222	100	9,092	100	12,314
1937	651	20	1,194	13	1,845	3,149	100	9,401	100	12,550
1938	572	19	1,275	12	1,847	3,058	100	10,889	100	13,947
1939	580	17	1,320	11	1,900	3,352	100	11,628	100	14,980
1940	670	19	1,565	13	2,235	3,448	100	12,672	100	16,120
1941	651	18	1,584	12	2,235	3,689	100	12,797	100	16,48[illegible]6
1942	743	18	1,508	11	2,251	4,107	100	13,768	100	17,87[illegible]6
1943	911	19	1,568	11	2,479	4,704	100	13,662	100	18,36[illegible]5
1944	831	20	1,824	12	2,655	4,086	100	15,836	100	19,92[illegible]6
1945	Not Available					*4,200		*16,400		*20,602[illegible]0

*Estimated

quantities of these selected products provided that the proper prices are maintained as against somewhat similar products.

It is difficult to generalize on the effect of quality of oils used for enriching of manufactured gas on their performance in a gas set. This is true for both the light and heavy gas-oils and is due primarily to the large and varied number of processes now in use. The influence of the operating variables, even in a given process, is great enough to overshadow the effect that the variations in the oil quality normally encountered may have on the overall economic picture.

As a typical illustration, let us examine some utilization figures which can be found in the Brown's Directory. The 24 biggest companies in the United States, each producing over one million M cu.ft. per year of carburetted water-gas, have an aggregate production of 123-6 million M cu.ft. per year. In this group we find that the oil utilization figures vary from 4.27 gallons per M cu.ft. to 2.33 gallons per M cu.ft. accompanied by coal utilization of 32.7 pounds per M cu.ft. to 15.0 pounds per M cu.ft. Taking at random a couple of high oil to coal and low oil to coal utilization ratios we find the following variations:

4.08 gallons of oil per M cu.ft. and 21.2 pounds of coal per M cu.ft.
4.01 gallons of oil per M cu.ft. and 17.9 pounds of coal per M cu.ft.
2.98 gallons of oil per M cu.ft. and 26.7 pounds of coal per M cu.ft.
2.88 gallons of oil per M cu.ft. and 24.0 pounds of coal per M cu.ft.

(Continued on page 56)

Motor Vehicle Outlook

Present-day motor vehicle situation with a comprehensive study of the possibilities of design and improvements that might well be incorporated in trucks of the future

BY EDWARD W. JAHN

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IT was with some trepidation that I accepted this assignment because of the state of uncertainty which prevails in the automotive industry. Conditions familiar to all of us have resulted in a very low output thus far this year. The president of the largest motor vehicle producing company states that the automotive industry will not get its production schedules up to the goal of 6,000,000 cars per year until the early part of 1948. Heretofore they had felt that this figure would be attained by early 1947. Their production for the first nine months has been at the rate of less than 4,000,000 units for 1946.

Before launching into things which may eventually come, it is refreshing to mention that fleet operators have benefitted by some war-born improvements, one of which is lubricants. So-called heavy duty motor oil which contains additives to inhibit the formation of sludge and to minimize sticking of valves and piston rings, has been quite helpful in improving the performance as well as prolonging the life of motors. The development of all-purpose lubricants for chassis and final drives, which may be used the year around, has materially reduced the number of different lubricants which must be carried in stock.

Lower Octane Ratings

High quality gasoline was also to be had for a short time after hostilities ceased. This fuel was practically gum free, with an octane rating as high as 90. However, the recent shortage of lead has set us back lower than pre-war standard insofar as octane ratings are concerned. The shortage of lead is also responsible for the present situation which confronts us concerning batteries, perhaps one of the tightest supply problems we have facing us in the immediate future. However, indications are that when lead is again in normal supply, we can look forward to having batteries which will not require the water to be replenished quite so frequently. In fact, a few manufacturers are now producing batteries which they claim will require water only three-to-four times a year. To use these batteries in your present car may necessitate alteration to the battery cradle as the cases are higher.

Higher Octane in 1948?

With few exceptions, cars produced during this year and 1947 will be substantially the same as those delivered in 1942. By 1948, or shortly thereafter, we may drive passenger cars with engines having compression ratios as high as 8.50 to 1, using super-chargers and requiring 100 octane gas. Most cooling systems will be of the pressure-type and all motors will be operated at higher temperatures. This should improve economy and increase the power out-put per unit displacement.

Automatic transmissions which eliminate the clutch pedal will be had on most of the better-grade cars, as will also be fluid drives, which are becoming more and more popular notwithstanding that they may be the cause of higher fuel consumption. There will also be improved riding qualities through the use of steel coil springs as well as a much wider use of rubber, including in some cases rubber Tors-Lastic springs. Disc brakes which are predicted to outlast the car are also a probability. Upholstery which can take a lot of punishment will find liberal use in both high and medium-priced cars. Together with the above, there will also come electrically heated windshields for defrosting, improved heaters, wider use of air conditioning, installation of soundproofing, vacuum power-operated windows, and two-way radios. Not all of these improvements, of course, will be of importance to fleet operators.

The year 1946 has seen the passing, at least temporarily, of the so-called low-priced cars, as the price of such units has been considerably advanced. A few months ago our hopes were raised by the announcement that both Ford and General Motors were planning to produce a new low-priced car; however, word has been passed that work on this so-called low-priced car has been stopped and all activity postponed for an indefinite period. We shall probably have to await the return of a buyers' market before we see a really low-priced car again.

Now as to trucks, what most of us had hoped for (and that is a truck which will not wear out, break down, never have to be turned up or overhauled) is not being promised. Truck manufacturers, particularly those in the heavy duty field, which covers units from two ton or 14,000 pounds Gross Vehicle Weight upward, have promised improvements some of which were sought by fleet operators in pre-war years. Let me mention some of those that are promised.

Better Truck Motors

Like passenger cars, truck motors will have higher compression ratios and produce greater horsepower and torque per pound of engine weight. But this will not greatly improve gasoline economy as most trucks used in utility service operate at half throttle or less the majority of the time, thus reducing the volumetric efficiency and nullifying to some degree the full benefits of higher compression. Valves and valve sets more resistant to heat will be practically standard equipment on all motors, as will also crankshafts case hardened electrically.

The cooling system is scheduled for improvement so as to make the draining of the radiators a simple operation.

Presented at 28th Annual Convention, American Gas Association, Atlantic City, N. J., Oct. 7-11.

Overflow tanks to recover anti-freeze will also find wider use; also water bypass valves to shorten the warm-up period. Thermostatically-controlled variable pitch fans are also receiving attention.

Some experimental work has been done in connection with the use of solid injection fuel systems, but it is doubtful if this system will be adopted for some time. Positive crankcase ventilation will be utilized on most motors so that they will no longer depend upon the speed of the vehicle for proper ventilation.

Oil filter bases of the universal-type will be an integral part of some motors, thus eliminating the use of special brackets. These bases will permit the use of several popular makes of oil filter elements. Larger capacity crankcases will be used to afford facilities for better cooling of the oil.

Although there has been a wide use of fluid drives for passenger cars and a similar application was made in tanks used during the past war, truck manufacturers seem to be reluctant to adopt them for trucks, except possibly light-duty units engaged in door-to-door deliveries. Look for an increase in the use of powershift two-speed rear axles which will be particularly advantageous where trucks are empty or lightly loaded. Power steering is also being given serious consideration by some manufacturers. Its use will permit greater weight on front axles and bring about a better distribution of load.

Improved Hydraulic Brakes

Improvements in the booster-type hydraulic brakes will be seen on a great many units. Likewise, there will be an increase in the use of air brakes, some companies using air brakes exclusively on units having a Gross Vehicle Weight of 20,000 pounds or more.

Coil springs will find greater use on light units and light trucks, but heavy duty units will continue the use of leaf springs. There may be some application of the use of dual coil springs and cantilevers, such as applied to semi-trailers.

Disc brakes in place of the conventional drum brake on wheels are another item viewed with some skepticism by the truck manufacturers who feel that certain complications cannot be offset by sufficient improvements to justify their adoption. This is probably due to the fact that brake drums and brake lining have been very materially improved in recent years so that most brake troubles in the past have been attributable to the use of undersize brakes and mechanisms, rather than to defects in design or the principle of operation.

Real progress has been made in the wiring on trucks by the use of junction boxes and independently fused circuits. This will not only reduce fire hazards but also facilitate the location of trouble.

The use of amphibious equipment during the war introduced the use of liquid insulating material which, when periodically applied to ignition wires and distributors, affords good protection against electrical trouble caused by rain and moisture-laden atmosphere. This material is also helpful when applied to the tops of batteries and terminals to inhibit corrosion. Applications every six months have been found to be, in most instances, quite satisfactory.

Genuine consideration has been given to the design of cabs, particular attention being given to safety by way of increasing visibility through the reduction of blind spots. The comfort of the operator has also been given real thought through better seat design, which will reduce fatigue. All of this will make for safety, as well as better working conditions.

Progress has also been made in the development of heaters for use in cabs and crew compartments where low temperatures make such equipment desirable. Heaters of the independently-fired-type are now available. This means that no longer will the motor have to be operated in order to provide hot water. The new-type heater is obviously economical and a few concerns who are using the improved heater report satisfactory performance.

In the very near future we shall, in all probability, have the opportunity to use synthetic motor oil. A company which pioneered in the development of the so-called permanent anti-freeze has developed a synthetic lubricant which gives promise of good performance. It would be well to watch this product.

The problem which confronts the men of the Technical Section and that of the fleet supervisors is to find ways and means to make further utilization of the motor vehicle in the gas industry. Truck motors are now used for such operations as pumping condensation from traps, operating air compressors, etc. Can we not find more uses for the truck motor besides moving the vehicle and increase its utilization through the use of air or other mediums so as to expedite work and reduce costs.

This is the challenge. What can we do about it?

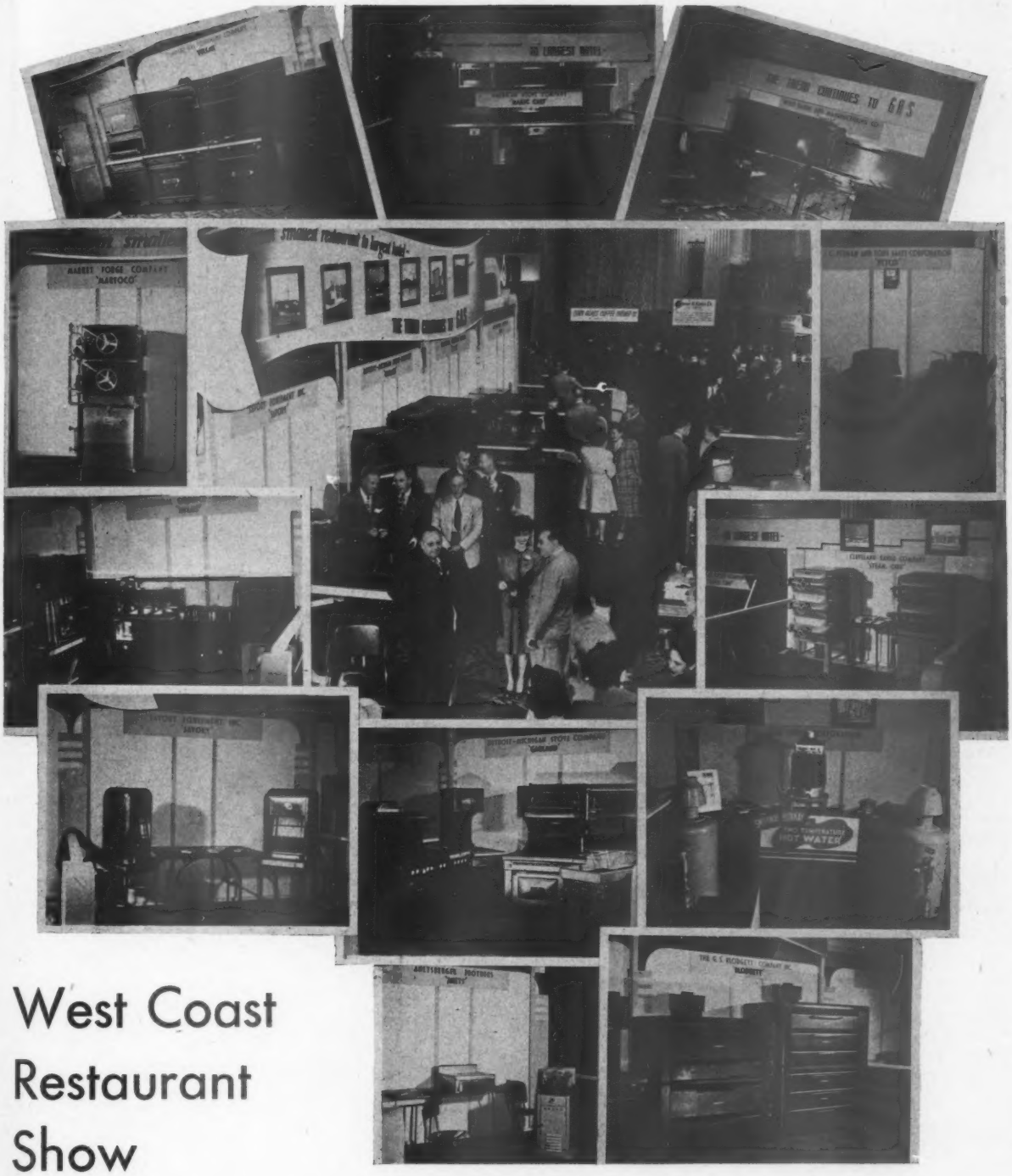
Plastic Gas Meter

FOR a number of years different men in the gas industry have attempted to develop a gas meter which would enable a person to watch it in operation. One made of glass was developed but found to be both impracticable and too costly to manufacture. Meters with glass fronts were experimented with but these failed to show the complete operation of the meter.

Now John Addison, a meter repairman, Public Service Electric and Gas Co., Newark, N. J., has developed a transparent plastic display meter that officials of the company's gas department believe far surpasses any other yet developed. It shows every part of the meter in operation.

Mr. Addison worked on the meter in his home for almost a year, using his gas range to heat some of the plastic to proper temperature for forming over metal parts of the meter to the right shape. He cut other parts, such as valve seats and guide brackets, out of solid stock. Approximately 80 percent of the 128 parts in the meter were made by hand from plastics.

John Addison, who developed the plastic gas meter



West Coast Restaurant Show

THE general display theme provided in the gas exhibit sponsored by the Natural Gas Bureau of the Southern California and Southern Counties Gas Companies, can be seen in the pictures taken at the National Restaurant Association's Pacific Coast Regional Convention, Los Angeles Biltmore Hotel, October 7-9.

Final registration showed that more than 7500 restaurant owners, operators and others interested in food service attended the Convention, which was highlighted by speeches and papers presented by outstanding restaurant authorities.

Displays of all types of equipment necessary to the volume cooking field were housed in the palatial ballroom of the hotel.

John L. Lewis Likes Gas Heat

JOHN L. LEWIS' house at Springfield, Illinois, wasn't cold last month on account of the coal strike.

The United Mine Workers' chief had gas heating installed in June, 1945, according to the United Press. He owns the house, which is occupied by his eighty-five-year-old mother, Mrs. Ann Louisa Lewis.

Gas Produced Electric Energy

STATISTICS compiled by the Federal Power Commission show that natural gas produced 8.88 percent of the nation's electric energy in 1945.

Coal, according to the compilation, produced 51.6 percent, this being divided between bituminous, 49.8 percent, anthracite, 1.5 percent, and lignite, 0.3 percent.

The remaining electric energy produced came from waterpower, 35.94 percent, oil, 3.5 percent, and wood and waste, 0.08 percent.

Book Review

EXPLOSION AND COMBUSTION PROCESSES IN GASES, by Wilhelm Jost and translated by Huber O. Croft. Published by McGraw Hill Book Co., N. Y., 1946. Cloth 6 x 9 in. 621 pages. Price $7.50.

ALTHOUGH now available in this excellent English translation, this book was actually written in Germany in 1935 and much water has run over the dam meanwhile. Yet it is in no sense dated for so few English publications have dealt exhaustively with these topics since Lewis and Van Elebe's highly technical Combustion, Flames and Explosions of Gases.

Jost freely indicates his debt to these authors and to others, stating that he has tried to include the significant work of the then most recent publications.

The English translation was undertaken at the suggestion of Dr. W. F. Durand of the NACA and Dean E. A. Moreland of the NDRC because American engineers concerned with the development of the basic theories of combustion were naturally interested in some of the applications of physical chemistry to this problem.

The emphasis in this book is on the combustion process as it applies to engines rather than combustion at constant pressure for heating. In fact, Jost characterizes combustion in a Bunsen flame as a stationary explosion.

In Chapter III this subject is expanded, some 73 pages being devoted to a detailed discussion of the rate of flame propagation as determined by various methods, the limits of inflammability and the propagation of flame in tubes. A short Chapter VI deals with Flames of Gases Not Premixed.

The reader is now ready for the rather detailed examination of flame temperatures and radiation investigations which make up Chapter VII.

Later in the book, the author takes up in individual chapters the combustion of specific gases, H_2-O_2 mixtures, CO, the hydrocarbons and then in the final chapters considers combustion in Otto and Diesel engine cycles.

The general treatment in this text emphasizes the mathematical relationships involved, thus giving the book a rather theoretical aspect. The book should have its greatest value to the advanced student of combustion processes and particularly to all engaged in research in this field. It would be an excellent counterpart to the recently published Fuels, Combustion and Furnaces by John Griswold which is intended to present the practical aspects of combustion, approaching the subject as it would be presented to senior engineering students.

—C. G. SEGELER.

A. G. A. Assists During Coal Crisis

ONCE again when John L. Lewis pulled the props from under the nation's fuel economy by calling the second bituminous coal strike in a period of six months, the American Gas Association rendered signal service to the government and the gas industry. It made a three-fold contribution of (1) supplying a running tabulation of coals stocks of manufactured and mixed gas companies, (2) furnishing experienced technical and statistical consultants to assist government agencies in making fuel allocations and administering curtailment orders, and (3) preparing conservation advertising for gas company use.

Before the strike began on November 20 the Association's Bureau of Statistics had modified its "Special Fuel Stock Survey" form, to provide all information that the Civilian Production Administration and the Solid Fuels Administration had found to be helpful in the strike last Spring. Consequently, when curtailment Order U-13, providing for conservation of coal by manufactured and mixed gas utilities, went into effect on November 25, the Association was in a position to supply full information promptly.

As of December 12, as the table below shows, the A. G. A. special fuel survey had furnished coal stock information on 167 gas utilities, representing more than three-fourths of the total residential meters in the affected category. A running tabulation of fuel stock forms was kept daily and the C.P.A. and S.F.A. were kept constantly advised of the situation. Both of these agencies relied solely on this information in judging the overall gas industry fuel situation and, to a considerable extent, in handling individual gas company problems.

To expedite this service to the government, two members of the A. G. A. staff were attached to the office of the administrator of C.P.A. and assigned to the Office for Emergency Control. Both assisted in easing fuel problems of gas companies in short supply and in administering curtailment Order U-13.

Meanwhile, the Association's Publicity Bureau in New York prepared a series of gas conservation advertisements and made a mat service available to all gas companies, whether A. G. A. members or not.

The Association is reviewing this situation in order that it may better serve gas companies and the government in any similar future emergency.

Order U-13 Revoked

UTILITIES Order U-13 providing curtailment measures for conservation of coal by manufactured and mixed gas utilities, was revoked on December 18 by the Civilian Production Administration. Other government orders were amended as follows:

Direction 17 to G.P.R. Order 21 was amended December 16 to give preference to public utilities and public sanitary services for coke deliveries when their supplies are less than 20 days' requirements.

Direction 10 to P.R. 32 was changed December 16 to permit gas companies to have a 60-day coke inventory.

As of December 12 Special Fuel Surveys had been received from 167 gas utilities with the tabulation of the date to which they could operate and the number of their residential consumers and population served being as follows:

Date		*Number of reports*	*Residential consumers (000)*	*Population served (000)*
November 20—November 30	10 or less	2	38.8	260.0
December 1—December 10	11–20	27	316.9	1,727.6
December 11—December 20	21–30	41	2,656.4	11,901.0
December 21—January 19	31–60	77	4,887.4	22,180.1
January 20 and later	Over 60	20	310.5	1,803.9
Total		167	8,210.0	37,872.6

This represents a coverage of 78 percent on the basis of residential consumers and 76 percent on the basis of population served.

Natural Gas Spring Meeting

THE Program Committee for the Annual Spring Meeting of the Natural Gas Department at Chicago on April 30, May 1-2 of next year has already set up a tentative program under the chairmanship of Floyd C. Brown, president, Natural Gas Pipeline Company of America.

Scope of the discussions will include: regulation, financing, states' rights, well-head price-fixing, depreciation theories, house heating saturation, and many other timely topics of interest to managements of natural gas utilities.

Seattle Gas "Oldtimers" Honored at Meeting

ONE hundred and fifteen members of the "Old Timers Club" of the Seattle Gas Company were honored guests at a banquet on November 25 at which time they received service pins to designate their years of service. The group has a membership of 188, requirement for which is five or more years of continuous service for the Seattle Gas Company. Of this number, 47 employees having 25 years or more service and representing a total of 1,534 years' service received pins of solid gold. N. Henry Gellert, president of the company, delivered the featured address of the evening and presented the gold pins to the group.

The service pin is in the form of a miniature gas holder with the blue flame of the gas industry imposed upon it in blue enamel.

The dean of the group was R. M. Anthony, who has been in the service of the company for a total of 54 years. Mrs. Laura Bratrud, with 36 years' service to her credit, was dean of the woman's group. Guest of honor was Major William P. French, an employee of the company who is still serving with the United States Army.

Charles M. Sturkey, vice-president and general manager of the company, substituted in the absence of the Club president by conducting the election of officers for the ensuing year and also acted as Master of Ceremonies for the occasion.

Consolidated Edison employee explains the functions of parts of a gas conversion burner for house heating to one of the classes taking the course sponsored by the company's Sales Department to disseminate information on the installation and starting of gas appliances

Appliance Installation Course Offered

CONSOLIDATED Edison Company of New York, Inc., in October began a series of courses on the installation, adjustment and starting of gas appliances, attended by plumbers, heating contractors, manufacturers and distributors of gas appliances, cooperating appliance dealers and builders. Consisting of three two-hour sessions on successive days, the courses are limited to 10 persons each so that the equipment demonstration can be observed by all who attend. Water heaters, burners, conversion burners, space heaters and industrial appliances, with piping, meters and other equipment connected are used in the lecture demonstrations, which are given by members of the Distribution Operation Department and Sales Department.

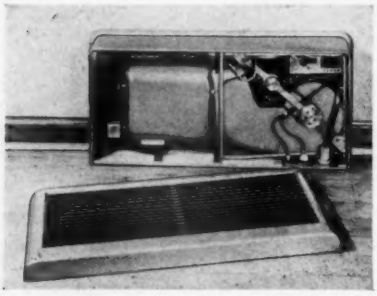
Classes are given in response to a Sales Department offer, sent to other members of the gas industry in the company's territory, for instruction in gas appliance installation along with a brochure of suggestions on installing and starting such appliances. Sessions will continue to be scheduled until all who expressed an interest have had an opportunity to attend. Similar instruction on the installation and starting of gas refrigerators recently was given to plumbers.

N. Henry Gellert, president, Seattle Gas Company, presenting R. M. Anthony, Dean of the "Old Timers Club" of the company, who has a total of 54 years' continuous service, with a gold service pin at a banquet in Seattle, November 25

Gas Detector Developed

THE National Bureau of Standards, Washington, D. C., has developed a colorimetric indicating gel which is claimed to be capable of detecting less than one part of carbon monoxide in 500,000,000 parts of air. It was developed during the war for use in military equipment and installation.

The gel, which is yellow, is said to turn shades of green and bluish green on exposure to low concentrations of the gas. The color that develops is then compared with a set of standard color chips in order to determine the amount of carbon monoxide in the air being tested.



South Wind Heater

Midget-Size Gas Heater Announced

A MIDGET gas furnace which, though no larger than a suitcase, is able to furnish enough controlled, circulating heat for two-and-a-half rooms and which evolved directly from airplane heaters developed during the war, was announced recently by Stewart-Warner Corporation.

The tiny motor-driven furnace uses natural, manufactured or bottled gas as fuel and its manufacturer hopes ultimately for it to be adapted to any kind of liquid or solid fuel. It can be used either as a "space heater" placed in a corner, or as a hidden unit. Its 14-inch width is narrow enough for it to fit between the joists of a basement or attic, feeding heat into a room from an ordinary register. Two furnaces, it is claimed, will heat a good-sized house.

The heater is an electric spark ignition instead of a pilot light. The fire is completely sealed up. It is fed from air outside the house and discharges on the outside. Thus there is an inclosed metal circuit from outside into the fire and outside again. This is said to be positive protection against fire and also against the possibility of asphyxiation. If the gas were to leak it would go outside.

Gas Industry Has Enviable Fire Record

COMPILATION of Fire Marshals' reports by the National Fire Protection Association, Boston, Mass., shows that gas and appliances enjoyed an enviable fire safety record during the war years 1941-45. The complete statistics were published in the October 1946 issue of the N. F. P. A. QUARTERLY.

Gas and appliances stood 22 in a list of 28 fire causes, and were accountable for only 4300 fires at a cost of $2,450,000 annually.

Among the competitive fuel industries, gas and appliances occupied the most enviable position near the bottom of the list. Here are some of the other tabulations, with their relative standings and figures: (3) Electrical, fixed services, 55,700 fires, $32,000,000 damage; (14) electrical power consuming appliances, 18,100 fires, $7,500,000 damage; (19) oil burners, 10,000 fires, $5,000,000 damage. There are no definite breakdowns for coal and wood as fire causes.

These figures are collated from reports of fire marshals from states representing approximately 30 percent of the nation's population. The compilation issued annually by N. F. P. A. is intended to indicate fire experience trends in the nation as an aid to government and private bodies interested in fire prevention.

"The Miracle Flame" Color Movie

ANOTHER important addition has been made to the numerous motion pictures that the Pacific Gas and Electric Co. makes available to clubs, civic organizations and other groups throughout the territory it serves.

The latest feature in the Pacific Gas and Electric Co. catalog is "The Miracle Flame" —a 16 millimeter color and sound movie produced by the Pacific Coast Gas Association. Its running time approximately 20 minutes.

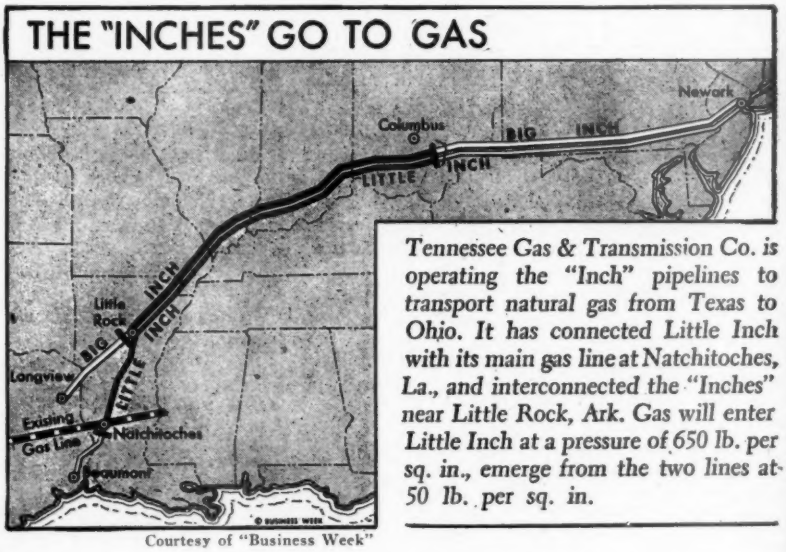
"The Miracle Flame" is the story of California's gas industry—how natural gas is formed, how geologists find it, how engineers tap the underground reservoirs and deliver it for almost countless uses in homes and businesses.

Opening with an animated sequence depicting in a few minutes Mother Nature's work of millions of years in forming natural gas deposits deep in the earth, "The Miracle Flame" dramatizes man's discovery of this fuel in ancient China and then presents a fascinating account of modern methods of drilling, piping, storing and distributing it.

Gas Fields and Pipe Lines Map

THE oil and gas fields of the United States, the major refining centers, and all major oil, gas and petroleum products pipe lines are shown on a new map released recently by the Geological Survey.

The map is printed on two sheets, each measuring 41 x 51 inches. It is titled "Oil and Gas Fields of the United States" by Paul Averitt, Jane Hanna, and Jane T. Carlton. Copies are obtainable from the Director of the Geological Survey, Washington 25, D. C. at $1.50 for the set of two sheets.



Courtesy of "Business Week"

Tennessee Gas & Transmission Co. is operating the "Inch" pipelines to transport natural gas from Texas to Ohio. It has connected Little Inch with its main gas line at Natchitoches, La., and interconnected the "Inches" near Little Rock, Ark. Gas will enter Little Inch at a pressure of 650 lb. per sq. in., emerge from the two lines at 50 lb. per sq. in.

THE Federal Power Commission early in December granted the Tennessee Gas and Transmission Co. permission to make use of the Big and Little Inch pipe lines for natural gas transmission for a period of 120 days.

Natural gas began flowing December 5 through the war-built pipe-line system at the rate of 50,000,000 cubic feet a day, headed from Louisiana northeastward to help relieve the fuel emergency resulting from the coal strike. It was estimated that the movement may reach a maximum of 150,000,000 cubic feet per day.

The F.P.C. also appointed an Industry Advisory Committee to assist in allocating natural gas supplies becoming available as result of utilization of the Inch lines.

Members of the committee were announced as follows: Gardner Symonds, president, Tennessee Gas and Transmission Co.; George S. Young, vice-president, Columbia Engineering Corp.; C. I. Weaver, president, The Ohio Fuel Gas Co.; L. L. Tonkin, president, Hope Natural Gas Co.; J French Robinson, president, The East Ohio Gas Co.; W. G. Maguire, chairman of the board, Panhandle Eastern Pipe Line Co.; D. P. Hartson, vice-president, Equitable Gas Co.; J. G. Montgomery, Jr. vice-president, United Natural Gas Co.; L. E. Ingham, vice-president, Kentucky Natural Gas Co., and L. B. Schiesz, president, Indiana Gas and Water Company.

Large Natural Gas Transportation Facilities

NEW construction and operation authorizations expected to make available to 71 large cities and many smaller communities an additional volume of more than a billion cubic feet of natural gas daily have been approved by the Federal Power Commission within recent months, Chairman Leland Olds announced December 16.

Many communities urgently needing additional supplies of natural gas to meet rapidly expanding demand for home heating will benefit as result of issuance by the F. P. C. between July 1, 1945 and September 30, 1946 of 90 certificates of public convenience and necessity for construction and operation of natural gas transportation facilities, Mr. Olds said. The new construction was planned to take place in 18 States and was intended to add at least 1,106,000,000 cubic feet of natural gas daily to the aggregate supply of several score of communities in many parts of the country.

Projects covered by certificates issued during the 14-month period involve construction of 4,465 miles of new gas pipe lines and new installation of 276,535 compressor horsepower.

A. G. A. to Exhibit at Heating Show

FORTY pieces of gas-fired equipment—all-year air-conditioning units, furnaces, space heaters and conversion burners—will be exhibited in an American Gas Association-sponsored booth at the 7th International Heating and Ventilating Exposition January 27-31 at Lakeside Hall, Cleveland, in conjunction with the convention of the American Society of Heating and Ventilating Engineers.

Although the Association booth will be larger than it has ever been in the past at this national show, the response to invitations issued to manufacturers to participate was overwhelming and all available space was quickly sold.

Michigan Company Plans Pipe Line Project

ANNOUNCEMENT has been made by the Michigan Consolidated Gas Co., of plans for a $90,000,000 pipe line to bring natural gas to the Great Lakes area from the Southwest. The Federal Power Commission recently gave its approval for the project.

The new line probably will not be completed before 1949. It will run for 1,076 miles, coming up from the Oklahoma wells of the Phillips Petroleum Company to fields northeast of Muskegon, near Austin, Michigan. The gas will be stored there for peak seasonal use.

From these fields one line will run down into Detroit. If financing is available, another line may be built to take care of western Michigan and the Milwaukee area.

Gas Range Sports A Shower

A. T. STAIRS, Canton, Oklahoma, inspecting an apartment house he had constructed, watched as utilities were turned on. Suddenly water began spurting out of the new gas ranges and bathroom heaters. Investigation revealed the plumbers had connected the water to the gas pipe and the gas fixtures to the water pipe.

Jones Describes 30-Inch Pipeline Installation

AN interesting article, "Yes! We Did Get Some 30" Pipe," by Charles C. Jones, superintendent, engineering division, Philadelphia Gas Works Co., Philadelphia, and chairman of the American Gas Association's Distribution Subcommittee on Cast Iron Pipe Standards (an A.S.A. project), appears in the fourth quarter issue of Pipe Progress, published by the American Cast Iron Pipe Co., Birmingham, Alabama.

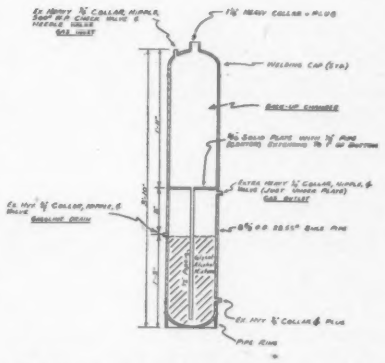
The article describes the installation of 8,300 ft. of 30-inch cast iron pipe, with mechanical joints, to carry gas in Philadelphia. In the article Mr. Jones also describes some general distribution problems.

Prevention of Pilot Regulator Freezing

AMONG the various devices that have been tried by the Oklahoma Natural Gas Company to dry the small quantities of gas used by pilot operated regulators and controls, one combination has evolved which it is believed has unusual merit. The device is in reality not a drier but a contactor containing diethylene glycol and alcohol.

The particular contactor which was used is shown in Figure 1. Gas enters at the upper left, passes through the top chamber, which is empty, down through the ½" pipe and then bubbles up through the fluid in the lower chamber. The treated gas leaves through an outlet immediately below the dividing partition. The chamber comprising the upper half of the contactor acts as a safeguard against a back surge of any sort which might blow the fluid out. The 1¼" collar at the top of the vessel affords a large opening for filling and provides a clean out plug for the riser below. One of the small collars on the side provides a means of filling to a predetermined level and as a drain for gasoline or distillate which may collect. The other small collar furnishes a place for draining. The liquid capacity of the device is approximately three gallons.

As strictly a dehydrator using diethylene glycol, the device has a capacity which compares favorably with other dehydrators of similar size using adsorbents. A reference to the equilibrium dewpoints of diethylene glycol-water solutions will show one great advantage, however. Instead of removing virtually all of the water in the gas being treated as do adsorbents, a liquid absorbent tends to maintain a constant dewpoint depression. Thus 80 percent by weight diethylene glycol in water will effect about a 15° F. depression in dewpoint and 90 percent solution a 28° F. depression. This means a considerable reduction in the amount of water removed from the gas being treated as atmospheric temperatures rise and the contactor becomes warmer. When this occurs, the instrument in which the gas is used becomes



Bearden type glycol-alcohol pilot gas tank

warmer and less apt to freeze so that no disadvantage as far as freezing results. The capacity of the absorbent is therefore better in terms of time between replacement.

Methanol (wood alcohol) alone in the contactor would theoretically saturate enough gas to prevent freeze-ups for reasonable periods of time in cold weather, but might evaporate too rapidly in warmer weather.

Combining diethylene glycol and methanol gives a dual protection that lasts for longer periods than either might be expected to alone. Evaporation of the alcohol is slowed down and dependence on drying alone is eliminated. The combination also simplifies maintenance. Practice has been to drain and recharge the entire unit once a season, using about two cups of alcohol (methanol) and the balance diethylene glycol. The balance of the season the operators add alcohol only or alcohol and glycol as experience dictates.

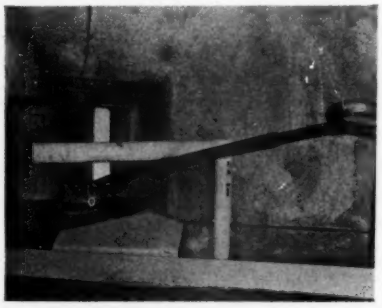
Experience with this unit in one field has dropped the number of trips to regulators to take care of freeze-ups from three a night to about one trip a month for checking the contactor.

Slag Bar Guard Developed

WORKMEN frequently suffer severe injury while using a slagging bar at boilers in power plants. When the long slag bar is pivoted through the slag door opening, heavy chunks of slag frequently fall and strike the far end of the bar. Naturally this causes the handle end of the bar to be jerked violently upward from the hands of the workman, usually striking him in the region of his head.

After one employee sustained a fractured jaw, this hazard was eliminated at the Twin Branch Steam Plant of the Indiana & Michigan Electric Co. of South Bend, Ind., through the use of the slag bar guard shown here. The guard was installed at the slag dam inspection door on a B & W open-pass type boiler. While in use the guard is latched automatically in position across the door opening. In order to overcome the human element, the guard was constructed so that it cannot be raised or lowered. If the workman could raise the guard, he might place it so high that it would become ineffective and thus defeat its purpose.

When not in use, the guard is swung around against the boiler wall so that it does not interfere with the opening and closing of the door.



Slag bar guard

Brooklyn Union Presents Long-Service Emblems

TWENTY years ago last month The Brooklyn Union Gas Co., Brooklyn, N. Y., instituted the custom of acknowledging long periods of service and special meritorious acts in a public ceremony, President Clifford E. Paige observed December 5 as he felicitated 327 company men with service records of 25, 30, 35, 40, 45, 50, 55 and 65 years.

This year four employees who received diamond-studded emblems from Mr. Paige for fifty-five years of service were John D. Howland, William J. Jamison, Luigi Russo and James H. Young.

Three employees who had reached the half-century milestone in service were presented a check for a year's salary by Mr. Paige in addition to their emblems. They were Richard P. Barry, Sr., Henry Deegan and Timothy McAuliffe.

John S. Averill, who started work 65 years ago, was the oldest in point of service at the ceremony. He is 85 years of age.

Fifty men with 40 years of service and 19 men with 45 years of service received their emblems from Vice-President B. G. Neilson.

Employees who completed 25, 30 and 35 years with the company will be given their emblems by their department heads at a separate ceremony. There are 92 in the 25 year group, 75 with 30 years' service and 83 with 35 years. All veterans with 35 years or more of service receive diamond-studded emblems.

John S. Averill, left, receives congratulations from Clifford E. Paige, president, The Brooklyn Union Gas Co., upon the completion of 65 years of company service

Convention Calendar

JANUARY

20-23 •A. G. A. Home Service Workshop, Netherland Plaza Hotel, Cincinnati.
22 •Accounting Section, Planning and Program Committees, Hotel Carter, Cleveland.
24 •Midwest Industrial Gas Council, Stevens Hotel, Chicago, Ill.
27-31 •Seventh International Heating and Ventilating Exposition, Lakeside Hall, Cleveland, Ohio.

FEBRUARY

13-14 •A. G. A. Residential Gas Section, Eastern Natural Gas Sales Conference, Roosevelt Hotel, Pittsburgh.

MARCH

17-18 •A. G. A. Residential Gas Section, Mid-West Gas Sales Conference, Edgewater Beach Hotel, Chicago.
17-19 •A. G. A. Sales Conference on Industrial and Commercial Gas, Copley-Plaza Hotel, Boston.
20-21 •New England Gas Association, Annual Convention, Boston, Mass.
25-27 •National Restaurant Association Convention, Stevens Hotel, Cleveland (A. G. A. will exhibit).

APRIL

7-9 •A. G. A.–E. I. Accounting Conference, Hotel Statler, Buffalo, N. Y.
7-9 •Mid-West Gas Association Annual Meeting, Hotel Paxton, Omaha, Neb.
14-16 •G.A.M.A. Annual Meeting, Drake Hotel, Chicago.
14-16 •A. G. A. Distribution and Motor Vehicle Conference, Hotel Cleveland, Cleveland, Ohio.
16-18 •Southern Gas Association, Biloxi, Miss.
25-26 •Gas Meters Association of Florida-Georgia Annual Meeting, Boca Raton, Fla.

MAY

Apr. 30-May 1-2 •A. G. A. Natural Gas Department Spring Meeting, Stevens Hotel, Chicago.
5-9 •A. G. A. Industrial Gas School, Hotel Seneca, Columbus, Ohio.
6-8 •Southwestern Gas Measurement Short Course, University of Oklahoma, Norman, Okla.
12-16 •A. G. A. Commercial Gas School, Washington, D. C.
15-17 •Indiana Gas Association, French Lick Springs Hotel, French Lick.
20-22 •Pennsylvania Gas Association, Wernersville, Pa.

JUNE

2-4 •A. G. A. Joint Production and Chemical Committee Conference, Hotel New Yorker, N. Y.
9-11 •Canadian Gas Association, General Brock Hotel, Niagara Falls, Ontario.
23-24 •A. G. A., N. Y.–N. J. Sales Conference, Essex and Sussex Hotel, Spring Lake, N. J.

SEPTEMBER

23-25 •Pacific Coast Gas Association, Hotel Del Coronado, San Diego
Sept. 29-Oct. 3 •A. G. A. Annual Convention, San Francisco, Calif.

Accounting Section

L. V. WATKINS, Chairman JOHN A. WILLIAMS, Vice-Chairman WALTER E. CAINE, Secretary

Bi-Monthly Billing

BY A. W. FYFE

Consolidated Edison Co. of New York, Inc., New York, N. Y.

THE term "Bi-Monthly Billing" as used in this presentation refers exclusively to bi-monthly billings based on bi-monthly meter readings. The merits of various other extended billing plans also were considered such as ten bills per year instead of twelve, bi-monthly meter reading and billing with interim month billings based on estimated readings, post card readings supplied by customers, billing with interim budget bills, and other variations of these plans.

The first formal step taken by the company to adopt some form of extended billing consisted of filing with the State Public Service Commission revised rate schedule sheets which would have provided considerable latitude in the choice of any one or more of the various plans of extended billing then under consideration. As the hearings before the Public Service Commission progressed, the company's studies had developed to the point where it was clearly evident that bi-monthly meter reading with bi-monthly billing was the most advantageous of the various plans under study. Also, the hearings before the Commission showed that there was some reluctance to allow the company the wide latitude provided for in the original petition which the company had filed with the Commission. Therefore, and further because the man-power shortage was rapidly becoming acute, it was decided to file an amended petition with the Commission providing for bi-monthly meter reading with bi-monthly billing. It can not be too greatly emphasized that the adoption of this plan was predicated upon a long range viewpoint which was based upon the conviction that this plan offered operating economies which could be maintained on a permanent basis; it was not adopted merely as a war-time measure to solve the temporary man-power shortage.

Plan Went to F.P.C.

The company's determination to limit its extended billing operation to this one plan was placed in the testimony before the Commission late in 1942 and an affirmative order was made by the Commission on March 16, 1943. The actual inception of bi-monthly meter reading and bi-monthly billing occurred in the company's Brooklyn District, involving approximately 850,000 electric service customers, with the omission of approximately 50 percent of the scheduled meter readings during the cycle month of June 1943 and the rendition of the first bi-monthly bills during July 1943.

The company would have preferred to gain experience in the Brooklyn District with bi-monthly billing and to appraise the results before extending the plan to other portions of its territory, but the rapid loss of man-power between early 1942 and June 1943 made urgent that the plan be extended to other portions of the company's territory without delay. Also, the merits of the plan had been confirmed by the earlier action of the Brooklyn Union Gas Co. in adopting bi-monthly meter reading and bi-monthly billing. In addition we had the knowledge that the Detroit Edison Co. had used this method successfully, during good times and bad, continuously since the termination of World War I.

In the light of these assurances and because of the pressure of the war, the practice of bi-monthly meter reading and bi-monthly billing was extended to the other portions of the company's territory in New York City during August 1943, thus placing about 98 percent of approximately 2,400,000 electric meters and 1,200,000 gas meters of the Consolidated Edison System in New York City on a bi-monthly basis.

The same conditions which prompted the adoption of bi-monthly meter reading and billing in the New York City territory of the Consolidated Edison Co. also resulted in its adoption by the Westchester Lighting Co. and The Yonkers Electric Light & Power Company. Both of these companies are affiliates to the Consolidated Edison Co. and serve the major portion of Westchester County immediately adjacent to New York City, through approximately 345,000 meters. While New York City embraces some suburban areas, it is predominantly a highly congested and highly industrialized metropolis. Westchester County, on the contrary, is essentially suburban and rural in nature. The Westchester companies serve approximately twice the area served by the Consolidated Edison Co. but have only approximately one-tenth the number of meters. The transportation of meter readers by automobile was an important consideration in Westchester County but of no significance in the New York City territory. In Westchester County approxi-

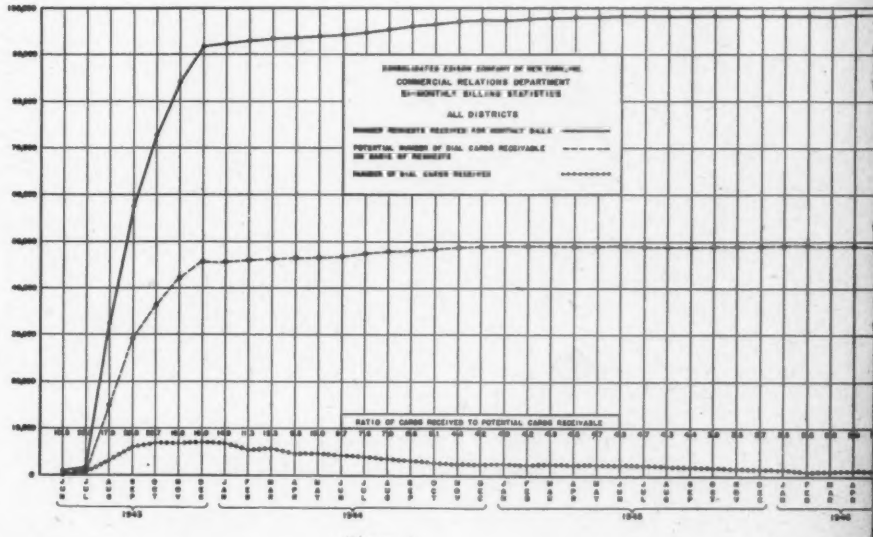


Figure 1

Abstract of address presented before the Accounting Conference of the Southeastern Electric Exchange, Charleston, S. C., October 18, 1946.

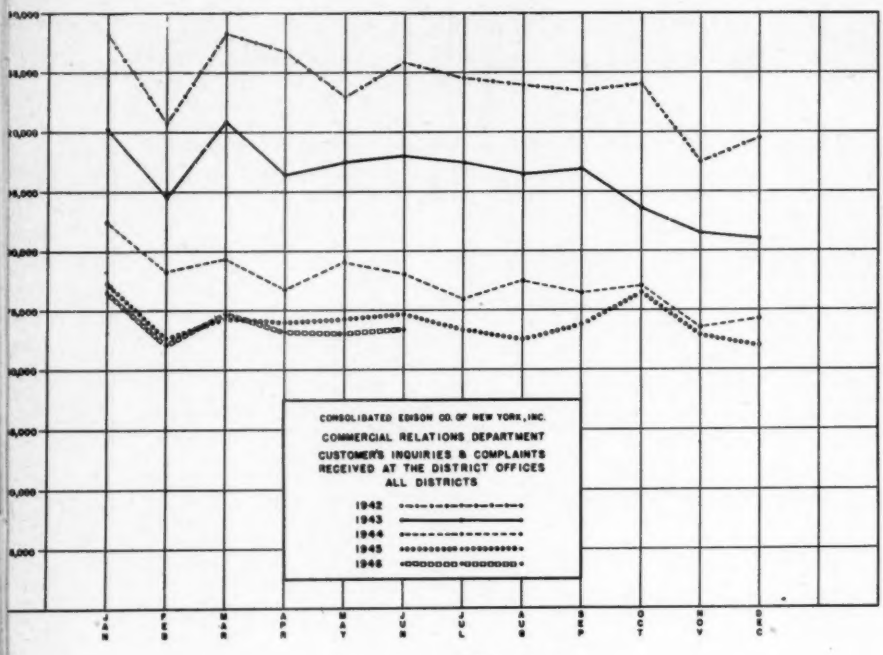


Figure 2

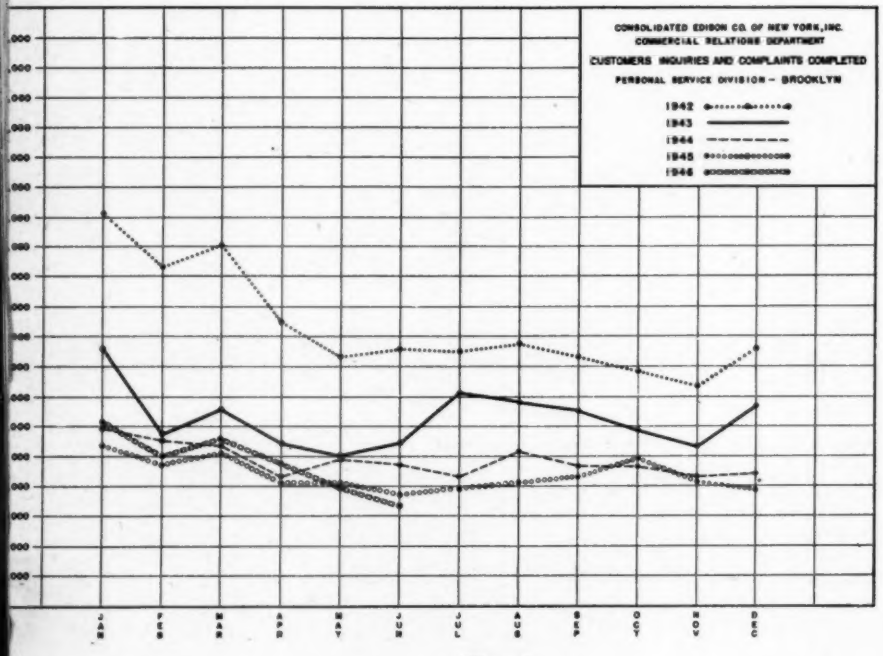


Figure 3

mately 120,000 miles of automobile routes per month were involved in meter reading and a reduction of about 40 percent was obtained through bi-monthly meter reading. Because of the widely scattered territory in Westchester County, gas heating customers were placed on a bi-monthly basis, whereas in New York City, the more congested residential areas did not attach the same penalty to monthly meter readings for house heating customers and consequently such accounts were continued on a monthly schedule.

With the exception of the difference with respect to house heating customers, however, the bi-monthly reading and billing plan was operated along identical lines.

Conversion to Bi-Monthly Billing

The actual step of converting to bi-monthly billing consisted of nothing more than the omission of approximately 50 percent of the scheduled readings in each of two successive predetermined months with resultant two-month billings for those accounts in each following month.

In addition to newspaper advertising of the change of billing, an explanatory enclosure form accompanied each customer's last monthly bill.

This enclosure is illustrated below.

IMPORTANT

You will not receive a bill for service next month

A plan of rendering a bill for service every two months has been inaugurated by this Company.

You will receive your next bill approximately two months from now and every two months thereafter.

Prompt payment of the total amount of this bill and all future bills will aid us in furthering the war effort.

CONSOLIDATED EDISON COMPANY
OF N. Y., INC.

This enclosure was followed by another explanatory enclosure which accompanied the first bi-monthly bill. The second enclosure is also illustrated.

SPECIAL NOTICE

This is a bill for two months' service

This bill represents charges for service for two months. Future bills will be rendered on the same basis.

Immediate payment of the total amount of this bill will help to conserve manpower and to effect economy in effort and supplies, and so will aid the war effort.

We ask your kind cooperation.

CONSOLIDATED EDISON COMPANY
OF NEW YORK, INC.

In order to secure the maximum benefits of labor economy under bi-monthly billing, cycle balancing of customers' ledgers was deferred to a two-months' basis in place of the former monthly balancing schedule. Sales closings, however, were continued on a monthly basis in order to include in each current month's revenue reports, the sizable sales of the commercial and industrial customers who were continued on a monthly basis, as well as the sales for interim and final bills rendered during each month.

During the initial month, when approximately 50 percent of the scheduled readings and billings were omitted, there was a distinct drop in the sales to be reported. This

deferment of sales occurred only in the initial month. The subsequent months reflected normal sales trends. The desirability of arbitrarily "adjusting" the first month's sales report under bi-monthly billing to offset the "deferred revenue" was weighed but this step was considered unnecessary. This decision relieved us of any necessity of continuously estimating deferred sales each month and adjusting our sales totals. Likewise, consideration was given to the desirability of establishing a special reserve for the deferred revenue resulting from the deferment of approximately 50 percent of the readings each month. However, it was decided that such a step was not required.

One of the contingencies of bi-monthly billing which we felt we should provide for was the reasonable expectation that, because of deferred billing and the larger amount per bill rendered, the amount of uncollectible bill losses would increase under bi-monthly billing. On the basis of available data and judgment it was concluded that, independent of any other consideration, uncollectible bills could reasonably be expected to be approximately 60 percent higher under bi-monthly billing than under monthly billing. To provide for this contingency, the reserve for uncollectibles was increased commensurate with such a possible increase in final bill losses. Only time will tell whether so substantial an increase in losses will occur. Collection losses have been inordinately low during the past few years and this has been true in our case also, in spite of any adverse influence which bi-monthly billing might have had.

Economies of Operation

As every utility accountant knows, personnel requirements, operating costs, potential benefits or savings of various proposed changes of methods or practices are definitely not equally applicable to all companies or even to the same company under different operating or different territorial conditions. We found this to be true in our case and we necessarily made allowances for such considerations. It is quite obvious, however, that we would not have been asked to relate our experiences with bi-monthly billing had we not been willing and able to offer tangible information as to estimated savings and some judgment of the extent to which these estimated savings had materialized.

In computing the estimated savings which would result from a change from monthly to bi-monthly billing, a complete analysis was prepared for each customer's accounting and related operation, whether or not it would be affected by the change, and to definitely establish the employee requirements by job classification title.

Likewise an estimate was made of the savings or increases in costs in materials and supplies resulting from bi-monthly billing.

As a result of the adoption of the bi-monthly plan of meter reading and billing, it was estimated that savings of 21 percent in personnel and 14 percent in dollars would be made, i.e.,

Savings	
Number of Employees	1,109
Labor	$2,095,400
Supplies and Expense	282,700
Increase in Uncollectible Bills	(388,200)
Total	$1,989,900

By major functions the annual labor savings were estimated to be apportioned as follows:

Meter Reading	238	employees	$ 452,600
Addressograph & Billing	82	"	121,700
Bookkeeping and Office Credit and Collection	439	"	841,800
Field Collecting	288	"	539,200
Miscellaneous Clerical	62	"	140,100
Total	1,109		$2,095,400

Since these groupings represent major functions, further details are required to be of practical value from an operating standpoint. It must be recognized that no two companies have identical operating conditions and that each company must evaluate its own requirements on the basis of the form and size of organization, extent of centralization or decentralization, rate structure, method of billing, etc. The estimated percentages of manhour reductions by representative functions under the conditions existing in our territory were:

Functions	*Percent of Reduction in Manhour Requirements*
Bookkeeper	35
Credit Clerk	21
Assistant Bookkeeper	24
Assistant Credit Clerk	20
Addressograph Operator	10
Bill Delivery Route Clerk	29
Bill Deliverer	44
Clerks in Collection Unit	33
Delinquent Collector	20
Clerks in Delinquent Accounts Unit	25
Distribution Clerks—Miscellaneous Orders	None
Final Bill Collections	None
Journal Clerk	13
Disbursement Teller	None
Receipts Teller (Excluding District Offices)	22
Receipts Clerk (Excluding District Offices)	40
Tabulating Machine Operator	20
Key Punch Operator (Alphabetic & Numeric)	23
Burroughs Billing Machine Operator	40
Meter Reading Inspector	33
Meter Reading Route Clerk	29
Meter Reader (Routine and Non-Routine)	35
Appliance Credit and Collection Clerk	None
Meter Reading and Ledger Transcription	15
Adjustment Representative—Office (Excluding District Offices)	21
Adjustment Representative—Field	11
District Office Service Clerk	9
District Office Teller	24
Telephone Service Clerk	None

In estimating the economies effected by the adoption of bi-monthly billing an important consideration and one which is always timely, but more acutely so today than at any other time in the past, is the fact that of the total dollars of operating expenses for customers accounting and related activities—meter reading, bookkeeping, billing, credit and collection, cash receipts, customer complaint and inquiry work—by far the largest proportion of the total expenses is involved in labor.

Reduction of labor expenses of $2,095,400 for 1,109 employees previously referred to was on the basis of 1941 salary levels, or an average annual salary of approximately $1,900.00. As of 1946 the comparable average salary figure has increased to approximately $2,576.00, or 35.5 percent over 1941; this results in an indicated present-day labor saving of approximately $2,800,000.00 per year. There has also been an increase in the cost of supplies and expenses. Certainly it must be recognized that, while the exigencies of war forced us to speed up our consideration of various forms of extended billing plans, the consideration of reduced operating expenses in the face of rising operating costs is a more vital consideration today than ever before.

The interested person would ask how experience has matched with expected results. As is always the case, the passage of time injects additional influences not anticipated and this was particularly true during the wartime conditions which existed subsequent to 1941. The following summarizes the outcome of our experience as compared to our estimates.

As previously stated, the estimated reduction in salary costs represented a reduction of 1,109 employees. As of January 1, 1942, there were 5,627 employees on the department payroll with slight surpluses in some groups but with shortages in other groups. As of January 1, 1944, there were 4,036 employees on the department payroll, a reduction of 1,591 employees in the two-year period. As of January 1, 1945 there were 3,760 employees on the department payroll, a total reduction of 1,867 employees during the three-year period. Because of other contributing factors such as exceptionally favorable economic conditions during the war years, restricted moving, the relative absence in our territory of war-boom populations, etc., we are unable to accurately segregate the proportion of reductions exclusively attributable to the successful working out of bi-monthly billing as against the proportion of reduction which resulted from other favorable causes. It has been our conclusion that our estimated reductions have been substantially exceeded in all classifications with the exception of meter reading. Our apparent failure to accomplish our estimated meter reading reduction was due to an external unfavorable influence directly related to war conditions. The reduction in cost of routine meter reading was fully accomplished, but an unanticipated increase in the cost of non-routine meter readings was experienced due principally to a substantial increase in the number of husbands and wives both working thereby aggravating our problem of missed readings. This condition, however, was in no way considered to be attributable to bi-monthly billing and, in fact, would undoubtedly have been even more serious with monthly billing.

Under full employment, high wages, and favorable economic conditions during the war, our estimate of higher uncollectibles did not materialize. Due largely to these favorable conditions, our uncollectible bill charge-off has reached the lowest ratio in our history. We still feel that, all other conditions being equal, provision should be made for higher losses under bi-monthly billing than under monthly billing.

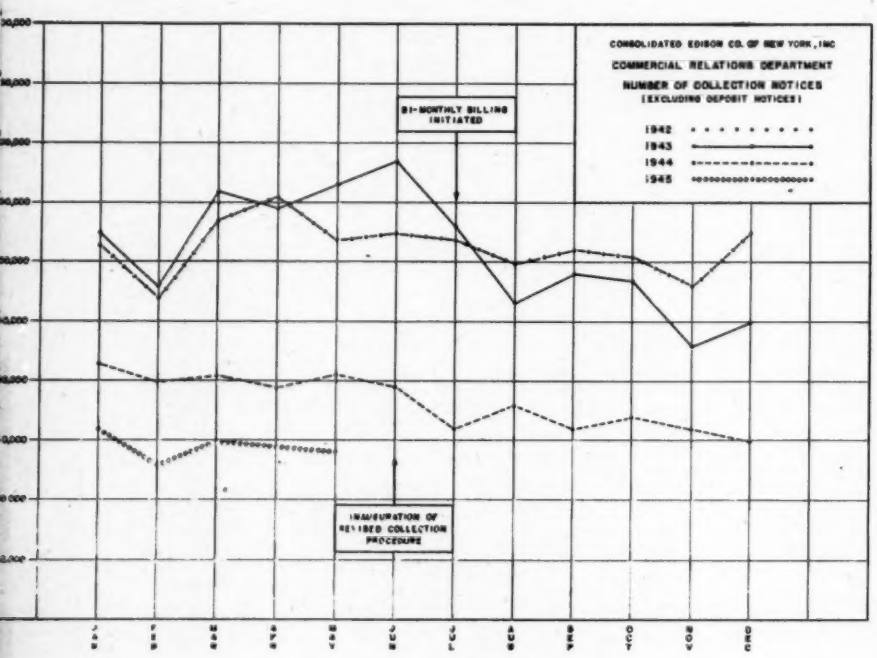


Figure 4

In addition to direct labor and other expenses such as stationery, bill forms, etc., there was some slight saving and benefit due to the reduction of wear and tear on office machines, billing machines, and addressographing and bill printing equipment.

Public Acceptance

Naturally one of the more important questions regarding so drastic a change in practice was the manner in which it would be received by the public. The two major objections which were raised at the hearings before the Public Service Commission were first, the disposition of the resulting labor surplus and second, the fact that the application of the then existing electric rate schedule for residential service to bi-monthly billing would result in an increase in revenue to the company averaging approximately five cents per customer per year. The company answered the first objection by giving its assurance that there would be no "lay-offs" as the result of bi-monthly billing. This promise was kept not only during the war when personnel losses were heavy due to employees leaving for military duty and war-time leaves, but also during the more recent periods when large numbers of employees returned from military duty and war-time leaves. The second objection was met by making provision so that any customers who insisted upon having a monthly bill would be supplied with meter reading post cards upon which they could indicate the dial position of the meters. Upon receipt of these cards the company would render monthly bills during the interim non-reading periods. While a determined effort was made in certain quarters to stimulate customer interest in this feature, experience showed that, on the whole, the public acceptance of bi-monthly billing was nearly unanimous. Reference to Figure 1 shows the number of customers who actually filled in the dial positions of the meters and sent the cards to the company, in relation to the total number of such requests. It is noteworthy that the ratio of such cards received to the total receivable reached a high of 28.0 in July, 1943 and thereafter rapidly decreased, reaching a low of 2.3 in June, 1946.

To further indicate the extent of the public's acceptance and the lack of unfavorable customer reaction reference is made to the facts indicated on Figures 2 and 3, which reflect customer attitude as expressed in terms of inquiries and complaints.

Experience Encouraging

Our experience in this respect, was most encouraging. As will be noted from Figures 2 and 3, there was no indication of any unfavorable customer reaction to bi-monthly reading and billing. The number of customers' inquiries and complaints, received at our district offices, as shown on Figure 2, continued to decrease during the years 1943, 44, 45 and 46. A comparison of the trend during these years with the trend established in 1942 clearly indicates the absence of any unfavorable customer reaction, while a comparison on a month to month and year to year basis shows the continuance of normal seasonal trends. Figure 3 shows our experience with respect to customers' inquiries and complaints completed by the Personal Service Division in the Brooklyn District. Here again, a year to year comparison shows no indication of any customer opposition to bi-monthly billing while a month to month comparison shows the normal seasonal reactions to weather conditions, i.e., spells of excessive cold and heat, restricted hours of daylight, etc.

Both of these Figures, (2 and 3) include high bill complaints and this fact is mentioned to show that despite the increased amount of the customers' bills under the bi-monthly plan there was no unfavorable customer reaction.

Figure 4, shows the number of collection

notices which were sent to customers during the year 1942 and thereafter. With the exception of a bulge in the number of collection notices immediately prior to the adoption of bi-monthly billing, which was the result of a special effort to bring the greatest possible number of delinquent customers to a current status, the figures for the ensuing months show a normal pattern. The statistics for 1944, during which year bi-monthly billing was completely in effect and by which time all temporary effects of the transition from monthly to bi-monthly billing had been passed, show a decidedly favorable picture as compared to previous years. A similarly favorable trend is reflected for the early months of 1945. For the purpose of this study, the number of notices sent out subsequent to May 1945 has been omitted from this chart. The reason for this omission is that it was felt that, since that point marked approximately two years of bi-monthly billing, an adequate record of experience was offered to date, plus the fact that an important modification of our collection practice became effective in June 1945 which was designed to place customers on a test basis for the balance of the year in an effort to determine their long-range paying habits. The results of that test are still being studied and while the test resulted in a downward distortion in the number of collection notices released to customers, the test and the results had no bearing on the question of monthly or bi-monthly billing.

Influence of the Bi-Monthly Billing Plan on Rate Reductions

While the merits of bi-monthly meter reading and billings assumed particular importance as a means of meeting wartime shortages of manpower and material, and, in some companies, of transportation equipment, gasoline and tires, the predominant long-range merit of this practice is its economy in operating costs. In the face of rising costs in wage levels and commodities, an overall increase or decrease in operating costs is a vital consideration to the utility industry and one which must inevitably be reflected in the rates charged for service supplied. From this standpoint the economies of bi-monthly billing are just as important as are the economies to be secured from any other decision which a utility makes in connection with changes of practice, the adoption of more efficient equipment, or the revision of its methods and procedures.

That a public utility has an obligation to operate as efficiently and economically as possible while rendering a high standard of service is a cardinal principle which has general acceptance in the utility industry. This principle was repeatedly emphasized in our approach to bi-monthly billing and a now classic recognition of this obligation from a regulatory viewpoint was expressed in the decision of the New York State Public Service Commission in P. S. C. Case No. 10928 decided September 11, 1942 in Re:—Brooklyn Union Gas Company, and was reaffirmed in the Commission's decision in Re:—Brooklyn Borough Gas Company, P. S. C. Case No. 10976, decided November 4, 1942. In the Brooklyn Union Gas Company case, the Commission stated, in part, as follows:

"In the face of present economic conditions and steadily rising prices of commodities and services *it is the imperative duty of the management of utility corporations to study their operating expenses and to make every endeavor to reduce expenses* where such reduction can be made without impairing the quality of their service to consumers. *It is in the interest of consumers that economies in operation be placed in effect* to prevent the spiraling of rates with other increases in living costs. The Commission should insist that no increases in rates and

charges for utility services be granted unless and until every possible economy in operating expenses has been explored and where feasible placed in effect."

It would be difficult to directly interpret the economies of bi-monthly billing into a proportionate share of the substantial rate reductions recently made. Nevertheless, it is obvious that our ability to make these rate reductions was materially influenced by operating savings of well in excess of $2,500,000.00 annually, on the basis of the present levels of salaries and material costs, which are indisputably attributable to bi-monthly meter reading and billing. Thus, this change in practice is directly entitled to an important share of the credit for the overall rate reductions.

The Future of Bi-Monthly Billing

This poses a question frequently asked of us and one which we can best answer by outlining the factors and considerations which of themselves will determine the answer for us. These principal considerations are enumerated below.

1. The successful operation of bi-monthly meter readings and bi-monthly billing by the Detroit Edison Company since 1917 is a record of over 25 years' experience under extreme fluctuations of economic conditions and in a highly industrialized area.
2. The electric and gas industries cannot overlook the historical fact that quarterly billing by water service companies in many localities is established practice and enjoys public approval.
3. The demonstrated economies of operation in our case offer a forceful argument for its continuance in line with our desire to follow the most efficient methods of operation.
4. Even with due consideration to the favorable economic conditions, we feel that the evidence previously presented as to public acceptance of the plan argues for its continuance.
5. Notwithstanding that prudent provision should be made for higher uncollectible losses probable with bi-monthly billing under conditions of severe economic stress, any such increases must be considered in the light of the substantially greater savings in operating expenses not only in poor times, but more particularly over the long-range. It is also our judgment that with either monthly or bi-monthly billing, a public utility's collection policies and practices must be sufficiently flexible to meet exigencies faced by individual customers and that such flexibility in assisting customers to meet the relatively larger bills rendered under bi-monthly billing will materially reduce the possibilities of larger ultimate losses.
6. It is our observation that those companies which have adopted "bi-monthly meter reading and bi-monthly billing" are inclined to the conclusion, as are we, that this practice should be continued for the future because of its substantial operating economies. On the other hand, it has been very evident that many of the relatively large number of companies who adopted other forms of bi-monthly meter reading with interim budget or estimated bills, or regularly scheduled interim postcard meter readings, are rapidly reverting to monthly billing because of the relatively minor economies and other shortcomings of these essentially wartime practices.

Conclusion

In closing I would say that, while we lay no claim to the faculty of seeing into the future and while we recognize our obligation to mould our future policies and practices to meet the expressed wishes of the public we serve, our experience to date leads us to the logical conclusion that there are many present and indicated future reasons for the continuance of this practice and no present or indicated future reasons for a return to monthly billing.

5 MEMORY GEMS

BE BRIEF
Politely

BE AGGRESSIVE
Tactfully

BE EMPHATIC
Pleasantly

BE POSITIVE
Diplomatically

BE RIGHT
Graciously

—S. D. Warren Co.

Automatic Point of View

BY E. CARL SORBY

George D. Roper Corporation
Rockford, Illinois

E. Carl Sorby

WE little realize how our influence permeates the lives of others. We are watched and often imitated without our knowledge. Even our silent attitude is often noted and has its influence. The written word placed in books, as the expression of the author, brings to us added knowledge and we are both inspired and richly instructed. The life of an artist is portrayed upon the canvas or in print. In the handiwork of the craftsman we see the shadow of the soul of the one who created it, giving it substance, life, and beauty. Our talk forms an image in the mind of the one who listens, and he is influenced thereby. There is a certain radiance about all personalities—to a greater or less degree.

Abraham Lincoln, in his Gettysburg Address, could have said, "What we say won't be remembered," and it wouldn't have been. But he didn't say it that way. Instead, he built the unforgettable sentence, "The world will little note nor long remember what we say here, but it can never forget what they did here."

Results of Hard Work

Many meetings have been held and many plans have been developed in the interest of better living for tomorrow. Many of us have been a part of these planning sessions, and out of it all we have been able to criticize our activities in the past in the spirit of helpfulness. As Aristotle said, "Criticism as it was first introduced was meant as a standard of judging well."

There are so many things I would like to discuss with you and so much to do that at times it becomes quite bewildering. I do feel, however, that I would like to talk to you first, about the past in order to give you a background for what is happening at present within our industry and from there attempt to predict what might take place in the future.

First, as chairman of the "CP" Group, I would like to have you know that there have been many planning meetings held in the interest of developing a program that would bring about the accomplishment of a No. 1 objective, and that is the sale of high quality, fine performing, beautiful to look at, automatic gas ranges built to "CP" standards. Time will not permit me to discuss all the ramifications of the competitive angles involved and discussed in attempting to come out with a more exhilarated program for the future in the interest of doing a more profitable gas range business. The committee members at work in this program feel that there is going to be no "middle road" or compromise in meeting and going beyond our electric competitors in our zeal and desire to give the American homemaker the ultimate in cooking service. We must resort to inventive ingenuity and intensive sales training to elevate the standard of our cooking and sales service. There is only one complete answer, and that is the promotion and sale of the automatic gas range to accomplish these objectives.

Back in 1926 the A. G. A. Blue Star became the outstanding symbol of safety on gas ranges. Many conscientious and sincere efforts were advanced in the merchandising of this Blue Star, and thus the first level towards an improved gas range was established. Over the years the Blue Star became an accepted symbol of safety; and while there might be some isolated cases of where gas ranges are made that do not meet A. G. A. Safety Requirements, nevertheless, it is an accepted fact that most of us just would not think of building a gas range without A. G. A. Approval and the Blue Star Seal.

Having passed this first level, we found ourselves on the second level of gas range improvement, and in 1937 a group of gas range manufacturers and utility executives set up standards of improvement in the gas range from a performance point of view. Thus, the "CP" gas range came into being. The "CP" Seal of the A. G. A. E. M., now

The ultimate in automatic cookery is incorporated in this "Town and Country" range which was on exhibit at the A. G. A. Convention.

Presented at the 28th Annual Convention, American Gas Association, Atlantic City, N. J., Oct. 7-11.

known as G. A. M. A., was representative of certified performance. The "CP" Seal, like the Blue Star, has been merchandised and promoted and now represents a standard of performance that 20 gas range manufacturers are building their products to meet. So far as we as a group are concerned, we should be very unwilling to build anything less than a gas range built to "CP" Standards, and our willingness to build a lesser type of range is brought about largely because of demands placed upon us for a unit that is not built to "CP" Standards. In the promotion, therefore, of "Automatic Gas Cooking" or the "Automatic Gas Range," which is in essence a range built to "CP" Standards, we tell everyone who reads our theme or themes on "Automatic Gas Cooking" or "Automatic Gas Ranges" that the appliance is "Automatic"; that it is a cooking appliance; that it uses gas as a fuel; and that it is a gas range. Therefore, we make the most of selling the "CP" Seal as a buyer's guide to "Automatic Gas Cooking." Emphasis should, therefore, be placed on selling, advertising, and promoting "Automatic Gas Cooking" or "Automatic Gas Ranges" built to "CP" specifications. "CP" is your reliable buyer's guide.

From this second level of accomplishment, we should have every reason to believe that there is room for a third level. Until that level has been established, let us make the most of selling "Modern Automatic Gas Cooking" and let the "CP" Seal be the buyer's guide in her selection of a complete cooking service. I am sure that we as manufacturers of "CP" gas ranges will, through creative thinking, inventive ingenuity, and the exercise of free manufacture, constantly produce a higher quality, finer "Automatic Gas Range." Consequently, we should have no fears for better things to come, and I am sure that under the shelter of the gas industry we shall travel to heights heretofore unknown. It is my firm belief that we will broaden tremendously the acceptance for the high quality gas range and a more modern gas range if our emphasis is placed on "Automatic Gas Cooking" or "Modern Automatic Gas Ranges"—more free time to do things you want to do. It cooks while you are away.

"CP" Specifications

In order that this philosophy can be further enriched and broadened, the "CP" gas range manufacturers have, in a number of meetings, discussed ways and means of broadening the base for the manufacture and production of gas ranges built to "CP" specifications. These new "CP" specifications were written with the primary thought in mind that a gas range, to be promoted properly, should be considered in all of its aspects from an "end results" point of view. By that we mean perfect pie baking, biscuit baking, and bread baking; more flexibility for all types of top burner cooking, waterless cooking, semi-waterless cooking, low pressure steam cooking, high pressure steam cooking, etc.; full flavor roasts and fowl; broiled foods from the broiler that makes the most discriminating gourmets drool for more. Therefore, all gas ranges built to "CP" Standards are to:

1. Display this A. G. A. Laboratory Approval Seal.
2. Be equipped with automatic time control (when and if automatic clock controls become available in sufficient quantity and meet all safety and operating standards of performance).
3. Be of flush-to-back-wall-only construction except kitchen heater and bungalow type ranges.
4. Have automatic oven ignition.
5. Have oven heat control.
6. Direct flue products away from wall.
7. Provide quiet operation of all drawers without undue friction or jamming.
8. Have effective stops on racks and drawers.
9. Have effective, smokeless type broiler pan.
10. Have automatic broiler ignition.
11. Provide 80 percent of grill area at minimum effective broiling area.
12. Have dual or Hi-low type oven burners.
13. Have one or more giant type burners.
14. Have automatic top lighters.
15. Provide rust resisting top burner heads.
16. Have oven capable of cooking or food processing at temperatures as low as 250°.
17. Possess top burner efficiencies of not less than 45 percent.

It did not take me long to review these new and most desirable specifications, but I do know that it has taken Paul Tappan's Committee on Revised "CP" Specifications many hours and many months of hard and arduous work to bring together a meeting of minds on these specifications. I know it has taken many arduous time consuming hours on the part of other committees, such as F. M. Rosenkrans' Committee on Improving Domestic Gas Appliances, interested in sales to come up with an interpretation that would be as broad in its various aspects as this new program is planned for. There are still plans in the making for the all-out activity in the interest of selling "Automatic Cooking" or "Automatic Gas Ranges." Just recently the A. G. A. Domestic Range Committee had a meeting to further correlate the efforts of many minds in the development of merchandising programs for gas ranges that would be productive of results. This committee is under the direction of J. Lea from the Atlantic Gas Light Co., Atlanta, Georgia.

The BUYING GUIDE for castle or cottage
Automatic Gas Ranges
BUILT TO CP STANDARDS
4 REASONS why you will want to recommend Gas Ranges bearing this seal:
LOOK FOR THE "CP" SEAL ON THESE AUTOMATIC GAS RANGES
A-B · CALORIC · DETROIT JEWEL
ESTATE HEATROLA · GARLAND · GLENWOOD
GRAND · HARDWICK · MAGIC CHEF
O'KEEFE & MERRITT · QUALITY · ROPER
SIGE-ACORN · SIGE-ORIOLE · TAPPAN
UNIVERSAL · WEDGEWOOD · WESTERN HOLLY
In Canada — CLARE BROS. · GURNEY · MOFFAT
GAS THE WONDER FLAME FOR AUTOMATIC COOKING
12,500,000* WOMEN
are reaching for...
Automatic Gas Ranges
BUILT TO CP STANDARDS
CASH IN ON THE "CP" PROGRAM WITH THESE FAMOUS BRAND NAMES
A-B · CALORIC · DETROIT JEWEL
ESTATE HEATROLA · GARLAND · GRAND
GLENWOOD · HARDWICK · MAGIC CHEF
O'KEEFE & MERRITT · QUALITY · ROPER
SIGE-ACORN · SIGE-ORIOLE · UNIVERSAL
TAPPAN · WEDGEWOOD · WESTERN HOLLY
In Canada
CLARE BROS. · GURNEY · MOFFAT
GAS THE WONDER FLAME FOR AUTOMATIC COOKING

Automatic gas ranges are brought before the public in GAMA's newspaper and magazine advertisements

Surveys and studies that now crowd many drawers in many files in our industry have revealed certain pertinent facts. None of us can deny the fact that since the introduction of the "CP" Program that from 1938 to 1941 the sale of gas ranges with oven heat controls increased 141 percent. That was, to put it in another way, after the "CP" Program had been born.

As a result of this demand for quality, your customers bought ranges that averaged $25 higher in price. This $25 spread over 2,400,000 gas ranges sold in 1941, more than an additional $60,000,000 in sales volume to you and your dealers, $60,000,000 in additional revenue obtained from selling on quality rather than price.

Every survey and every study has revealed that women are reaching with outstretched hands for:

Automatic heat control
Automatic oven lighting
Automatic clock control
Simmer speed types of burners
Giant burners
Glass oven doors
Better insulation
Rust resisting burners
High broilers
Etc.

After having studied these surveys and digested the contents of women's wants, hopes,

and desires, I weaken and find myself mopping from my brow beads of perspiration as big as baseballs to think how ineffective our activities of the past evidently have been in relation to their demands in the present and the future for features and devices that we have, all of us together, so conscientiously tried to promote and sell in the years prior to the war.

1. Why, if we have done in our minds such a good job of promoting automatic ignition, does such a large percentage of American women indicate by their answers to questionnaires that they never knew it existed? So, percentagewise it becomes a postwar "Must."

2. Why, if we, in our own minds, feel that we have done such a good job in promoting high broilers, do women cry out for them today when we have had them for so many years?

3. Why, if, in our own minds, we feel we have done such a superb job of selling simmer speed burners, do women reach out and say: "I want a gas range with simmer speed burners?" So, we can go on and analyze each one of these consumer "Musts" and "Firsts" and by putting reverse English on the treatment of our sales story, we find so much to do to stimulate and to sell and promote the sale of these features which women say are "Musts" in their new gas ranges.

Let us not become so steeped in our personal opinions and viewpoints on what is good and what is bad for the consumer as to become corroded and oblivious to the consumer's demand for things that very often we as individuals say they don't want. True, there are many things left to be desired.

I can assure you that within the laboratories of at least some manufacturers real research is going on in the development of single point ignition as a highly desirable feature. The final answer to single point ignition is still in the distant future.

I know that much research and much development work is being carried on in the development of the ultimate in automatic clock control. I am told that the day is not very far off when this will come into being. One hundred percent primary air burners are a much to be desired feature also, but again it is something that you can not hope for tomorrow or next month. All of this bespeaks the enthusiasm on the part of manufacturers of gas ranges and manufacturers of appliances and of appurtenances that are attached thereto in their zeal to produce a higher quality, finer performing gas range. Competitively let us not be thrown into tantrums of fear when somebody says "Boo" or "Reddy Kilowatt will sneak up and bite you some day." They too, have their problems. So again, we should take heart in the knowledge that up to now we do possess and have a superior cooking appliance. Regrettable and hard as it is to admit, we have not sold the American public on the things we have had to sell evidenced by their lack of knowledge in the things we have and by their wants for the gas range in the postwar period.

There are many plans and programs that are completely developed and ready for announcement. The time is not propitious for the all-out endeavor on the part of manufacturers, utilities, and dealers to carry to full fruition the results of these efforts.

Let me assure all of you that we are not just sitting by looking out the window any more than A. G. A. is relaxing in its efforts to stimulate and develop its market for fuel in the future. I need not remind you of the potency of A. G. A.'s national advertising campaign. I need not remind you of the stimulating effects that showing the New Freedom Gas Kitchen, with emphasis on the appliance, in its ads have had and will have on public opinion toward gas in the future. Too many plans are still being planned. Too many programs are still being programed. We have bridged the gap between the fantastic and the practical. We are down to earth on the things we know we can have and you can have. It is time we quit dreaming.

It is time for us to sell what we have.

And in those days, behold, there came through the Gates of the City, a salesman from afar off, and it came to pass, as the day went by, he sold plenty. They that were the grouches smiled on him and gave him the hand that is glad. The tightwads opened their purses to him.

And in that City were they that were the order-takers, and they that spent their days in adding to the alibi sheets. Mightily were they astonished. They said one to the other, "What the hell; how doth he get away with it?" And it came to pass that many were gathered in the back office and a soothsayer came among them. And he was one wise guy. And they spoke and questioned him saying, "How is it that this stranger accomplished the impossible?" Whereupon the soothsayer made answer: "He of whom you speak is one hustler. He ariseth very early in the morning and goeth forth full of pep. He complaineth not, neither does he knock. He is arrayed in purple and fine linen, while ye go forth with faces unshaven and pants not pressed. While ye gather here and say one to the other, 'Verily! This is a terrible day to work,' he is already abroad. And when the eleventh hour cometh, he needeth no alibis. He saith not to the mass, 'Behold, they that are in this town are a bunch of boneheads.' Nor doth he report that they cannot be sold. He knoweth his line and they that would stave him off, they gave him orders. Men say unto him, 'Nay, nay,' when he cometh in, yet when he goeth forth he hath their names on the line that is dotted. Believe it or not—it works! He taketh with him two angels—'Aspiration' and 'Perspiration.' He knoweth whereof he speaketh and he worketh to beat hell. Verily, I say unto you, 'go and do likewise.'"

Home Service Workshop Maps Program

A NATIONAL Home Service Workshop sponsored by the Home Service Committee of the American Gas Association will be held January 20-23 at the Netherland-Plaza Hotel, Cincinnati, Ohio. Program for the four-day workshop is being prepared by a committee headed by Mrs. Mary Belle Burnett, Cincinnati Gas and Electric Co., chairman of the A. G. A. Home Service Committee.

The first day's program is planned to include "Home Service Fits Into 1947 Sales Promotion," by W. M. Chamberlain, chairman, A. G. A. Residential Gas Section, Michigan Consolidated Gas Co., "All Things To All Communities," by Ruth Shank, St. Louis County Gas Co., Webster Groves, Mo.; "What's New in Foods," by George Garnatz, director, The Kroger Food Foundation, Cincinnati, Ohio; "The New Freedom Gas Kitchens, Pivot of Home Service Promotion," by Chairman Burnett; "A Stage Setting For Demonstrations," by Anne McManus, East Ohio Gas Co., Cleveland; "Sales Floor Displays of New Freedom Gas Kitchen," by Lois Dineen, Equitable Gas Co., Pittsburgh; "How to Conduct a Discussion Group," by Roy Battles, farm program director, Radio Station W.L.W., Cincinnati, and discussion groups.

Planning Home Service Workshop, seated left to right: Helen Kirtland, The Ohio Fuel Gas Co., Columbus; Mary Belle Burnett, chairman, A. G. A. Home Service Committee, The Cincinnati Gas and Electric Co., Cincinnati; Ruth Shank, St. Louis County Gas Co., Webster Groves, Mo.; Jessie McQueen, home service counsellor, American Gas Association

A luncheon is planned for Monday in the Hall of Mirrors, Netherland-Plaza Hotel. Speakers at the luncheon will include "Welcome to Cincinnati," by Honorable James Garfield Stewart, Mayor of Cincinnati, "The Gas Industry Moves Ahead," by W. C. Beckjord, president, Cincinnati Gas and Electric Co., and "What the A. G. A. Means To You," by H. Carl Wolf, managing director, American Gas Association.

On the second day the following papers are planned: "Correction of Baking Complaints," by Joan Huck, American Gas Association Testing Laboratories, Cleveland; "Building a CP Range," by Paul I. Berno, development manager, Tappan Stove Co., Mansfield, Ohio; "The Clock Control," by Gladys Price, Southern California Gas Co., Los Angeles; "New Talent Evaluates the Home Call," a discussion and sketch of sales follow-up home calls which will be presented by the Home Service Dept., Ohio Fuel Gas Co., Columbus; "Cooking Equipment for School Lunchrooms," by Paul W. Craig, manager of industrial and commercial sales, Equitable Gas Co., Pittsburgh, Pa.; "Getting Into Hot Water," by W. D. Williams, assistant sales representative, Public Service Electric and Gas Co., Newark; "Laundry Techniques," by Eleanor Ahern, Proctor and Gamble, Cincinnati; "What's New in Textiles," by Catherine Gerstenberger, associate professor of textiles and clothing, University of Cincinnati, Cincinnati; "The Fourth Cooking Zone," a demonstration by Rebecca Sullivan, The Gas Service Co., Topeka.

The third day will include reports from discussion leaders and a symposium entitled, "Starting Out on the Job," in addition to "Starting in a One-Girl Department," by Carolyn M. Davis, Nashville Gas and Heating Co., Nashville; "Starting in a District," by Ellen Miner, Columbia Gas and Electric Co., Columbia, S. C.; "An Apprenticeship Program," by Eleanor Morrison, Michigan Consolidated Gas Co., Grand Rapids; "Home Service Program Under Way," a symposium; "A Sales-Slanted Demonstration," by Elizabeth Lynahan, The Peoples Gas Light and Coke Co., Chicago; "Demonstration Ideas," by Colleen Fowler, Kansas City Gas Co., Kansas City; "A Demonstration Kit for Dealers," by Mary Huck, Ohio Fuel Gas Co., Columbus; "Good Service on Gas Refrigerators," by William W. Marshall, service supervisor, Minneapolis Gas Light Co., Minneapolis; and "Research Program on Kitchen Planning," by Clara Ridder, Servel Inc., Evansville, Ind.

The final day's program will include discussion groups, "Use the Feminine Slant, Mr. Salesman," by Helen Kirtland, Ohio Fuel Gas Co., Columbus; "An Amateur Sets Up Food Photographs," by Ruth B. Soule, The Brooklyn Union Gas Co.; "Home Service a Career," by Margareta Ackermann, Cincinnati Gas & Electric Co.; "Keying Information to Women's Needs," by Alic Blinn, associate editor, *Ladies Home Journal*, New York; and "Gold Is Where You Find It," by H. Vinton Potter, American Gas Association, New York.

Business Girls' Luncheon Club members preparing one of their popular lunches. Second from the right is Flora G. Dowler, home service supervisor, Manufacturers Light and Heat Co., Pittsburgh, and third from right is Helen Wilcox, home service director, Binghamton Gas Works Company

Luncheon Club for Business Girls

OUT of the success of a breakfast club sponsored by the home service department of the Binghamton Gas Works, Binghamton, N. Y., in 1945 grew a series of four participation luncheons for department store girls.

Called the Business Girls' Luncheon Club, the objective was to show the girls who had enrolled how to prepare and serve a lunch during their lunch hour. Groups of four made up a working unit and each unit prepared a planned menu and served it. Helen Wilcox, home service director of the company, supervised the preparations. Twenty-four girls enrolled in the club, and a different menu was prepared for each luncheon, at which Miss Wilcox discussed the menus, how to plan market orders and other phases of lunch preparation.

A. H. E. A. Building Fund Gets Prize Money

MARGUERITE FENNER, Pacific Gas and Electric Co., San Francisco, third prize winner of the McCall's Magazine Award Contest, has announced that the $50.00 prize money received has been contributed to the American Home Economics Association Building Fund. The fund is to be used for the erection of a building for the Association in Washington, D. C.

Intensive Domestic Gas Program for 1947

CHAIRMEN and members of the operating committees of the Residential Gas Section of the American Gas Association meeting in Chicago from December 10-12, adopted action programs destined to make 1947 an outstanding year in the promotion of the sale of gas for residential use. More than 50 representatives of member companies and the Association were in attendance, participating in meetings that covered almost every phase of residential gas sales. Wallace M. Chamberlain, Michigan Consolidated Gas Co., Grand Rapids, Mich., chairman, and Chester S. Stackpole, Consolidated Gas Electric Light & Power Co., of Baltimore, vice-chairman, respectively of the Residential Gas Section, aided the chairmen of the operating committees in organizing their meetings.

In addition to formulating operational plans for the Residential Gas Section, tentative programs were outlined for the three regional sales conferences to be sponsored by the Section next year. Plans for the Eastern Natural Gas Sales Conference in Pittsburgh, February 13-14, and the Mid-West Gas Sales Conference in Chicago, March 17-18, virtually are completed. Interesting and authoritative speakers have been booked for both conferences and advance registrations in each instance indicate exceptional attendance. Preliminary plans for the third of the series, the New York-New Jersey Sales Conference at Spring Lake, N. J., June 23-24, also are nearing completion, and hold promise of equal success.

Plans of the operating committees of the Residential Gas Section for next year include the publication of two bulletins by the Dealer Relations Committee. One bulletin will be devoted to selling the industry on the necessity of a satisfactory dealer co-operative plan. A composite plan will be set up, embodying the points the committee believes should be incorporated in such a plan, including a restatement of the A. G. A.'s merchandising policies.

The committee also plans to publish a number of plans now in operation that have proved to be satisfactory, with the thought that member companies will be able to adapt various details of such plans for their own use.

The Appliance Financing Committee expects to complete its report on postwar ap-

At the recent Chicago meeting of the Midwest Regional Gas Sales Council were W. M. Chamberlain, chairman, Residential Gas Section, B. H. Wittman, vice-chairman, Midwest Regional Gas Sales Council, J. C. Sackman, chairman of the Council and F. W. Williams, secretary, Residential Gas Section of American Gas Association, N. Y.

pliance financing trends, which will include information on Regulation "W," and plans on gas appliance financing available from national institutions such as financing companies, banks and others.

Plans for revitalizing the "CP" Range promotion program through resumption of the "CP" Ranger Club and the "CP" News Letter were approved by the Domestic Range Committee. This program at a company level will be carried out in eight regional sections throughout the country, at an accelerated rate as soon as ranges are available.

The Home Service Committee reported a splendid program had been arranged for the first of the Regional Home Service Workshops at Cincinnati from January 20-23. Outstanding speakers have been recruited to cover every field that is of interest to home service, promotional and sales members of the gas industry. Activities planned by the Home Service Committee include development of an apprenticeship plan to be sponsored where gas companies wish to work with colleges in getting qualified girls for home service positions.

Both the Committee on Improving Domestice Appliances and the House Heating and Air Conditioning Committees will devote considerable attention in 1947 to the upgrading of appliances and installations in their separate fields. The New Freedom Gas Kitchen Committee and the Managing Committee of the Residential Gas Section approved the plans of the Association's Promotional Bureau to promote the New Freedom Gas Laundry early next year when appliances become available.

Consolidated Blood Bank

LABOR and management representatives of Consolidated Edison Co. of New York, Inc., take part in a demonstration initiating a new cooperative blood bank service for Edison employees. H. R. Searing, executive vice-president, A. Augustus Low, vice-president, industrial relations, and Dr. J. J. Wittmer, assistant vice-president, watch as Patrick McGrath, chairman of Joint Council, Brotherhood of Consolidated Edison Employees, submits to a blood pressure test by Nurse Annabelle Lahey. The new service, arranged with Blood Bank of Queens County, Inc., by employees' mutual aid society and company's medical department, provides for a prompt supply of blood for transfusion when needed by an employee or his immediate family.

Production of Coke

THE production of gashouse coke in the United States in 1945 totaled 859,246 net tons valued at $7,282,195, according to reports received from producers by the Bureau of Mines, United States Department of the Interior. When compared with 1944, this represented a decrease of 2 percent in output but an increase of 3 percent in value due to increased manufacturing costs.

Output of screenings or breeze in 1945 totaled 99,091 net tons, a slight decline from the 1944 production. The rate of production in 1945 did not change from the preceding year and was 77 percent of capacity. Of the 2,826 retorts reported in existence at the end of the year, 2,199 were in active operation, reductions of 158 and 222 retorts, respectively, from the numbers reported in 1944. The decline in number of retorts in operation in December, 1945, was due to the substitution of water gas for coal gas at one plant, propane vapor at one plant, propane-air gas at two plants, and natural gas at one plant.

The increase in maximum rices applicable to sales of bituminous coal shipped from mines in 1945 resulted in a sharp gain in the costs of bituminous coal delivered to gas plants. The average cost per ton of coal charged into retorts advanced 22 cents over 1944 and reached $6.82. Government controls over the distribution of "special purpose coal" used in the manufacture of gas in gas retorts remained under the jurisdication of the Solid Fuels Administration for War during 1945. Coalgas plants were included in the grouping of industrial consumers of bituminous coal that were assured of first preference in the distribution of bituminous coal under provisions of SFAW Regulation No. 27 issued March 14, 1945.

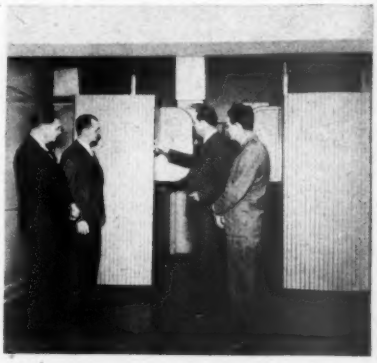
According to returns received from producers, consumption of gashouse coke at producing plants totaled 393,283 tons and was equivalent to 45 percent of the total quantity sold or used by producers. Of the 393,283 tons used by producers, nearly half, or 47 percent was consumed in heating benches, 37 percent in adjacent watergas generators, and the remainder, or 16 percent, for making producer gas, raising steam, and heating buildings.

Air Conditioning Service School Held

REPRESENTATIVES from 24 utility companies in 15 states attended the air conditioning service school November 18—22 at Servel, Inc., Evansville, Indiana. New school-room facilities of the air conditioning division were used for the first time at the service school.

R. E. Davis, air conditioning service manager, had charge of the school, assisted by A. J. Gilbreath, H. H. Phipps, Edward Head, Chester Attwood, Paul Williams, and Don Smith, all of the air conditioning division.

School sessions covered problems likely to occur in servicing the all-year air-conditioner.



"Students" at the recent air conditioning application engineering school held at Servel, Inc., Evansville, Indiana, look on as H. C. Pierce, center, assistant manager in air conditioning, conducts a lecture. "Students" are J. E. Morrissey, Public Service Company of Northern Illinois, Evanston, Illinois; M. J. Westenhaver, and W. R. Doughty of the Illinois Power Co., Belleville, Illinois

Gas at Metal Show

THE American Gas Association Combined Industrial Gas Exhibit at the National Metal Congress and Exposition held in Atlantic City, N. J., November 18-22, was the largest and one of the most attractive exhibits at the metal industry's annual event.

In a setting of blue and white, 14 large columns connected by strips bearing legends setting forth on the outer side, the advantages of gas for industrial heating, and on the inner side, the uses of gas in industry, surrounded the 5,000 foot area. Attracting the visitor as far as the eye could see, eight large mechanical gas flames served as beacons for those particularly interested in industrial heating problems.

The 12 manufacturers of industrial gas equipment cooperating in the combined exhibit showed a wide variety of gas-fired equipment for practically every type of metal processing. Two large trend charts formed the arches leading into the A. G. A. lounge from each side aisle with the slogan, "More and More the Trend Continues to Gas." One side had the legend "For All Industrial Heating," and the other side, "The Ideal Fuel." It was here that visiting gas men representing companies east of the Mississippi met with manufacturers and dealers to exchange views on industrial gas utilization. It was the consensus of opinion that this first postwar combined exhibit was the finest and most successful of all sponsored by A. G. A.

The more than 42,000 visitors to the exposition showed an active interest in all the exhibits. Many new applications of elements were shown which only a short time ago were only laboratory items. New alloys which the metallurgist has made available will be a boon to better living. Among these that will be of interest to women are the gleaming stainless steel sink, the enameled gas range, an endless chain of gleaming pots and pans and satin-like silver and keen carving tools. That gas plays an important part in the production of all these items was evidenced by the fact that the displays of industrial gas equipment outnumbered those of any single phase of the metal industry.

The twelve manufacturers directly cooperating in the A. G. A. Combined Industrial Gas Exhibit were:

Side view of the A. G. A.'s combined industrial gas exhibit at the National Metal Congress

Lounge where gas men gathered at the metal show held at Atlantic City, November 18-22

Companies That Exhibited

American Gas Furnace Co., Elizabeth, N. J., who displayed one of their gas-fired reciprocating full muffle-heating machines, and an operating assortment of burner tips of special flame patterns for application to a wide variety of uses.

Bryant Heater Co., Industrial Division, Cleveland, had many operating burners demonstrating their blower and Flomixer with an assortment of burner tips. There was also a large industrial burner operating intermittently to illustrate commonly used gas combustion components. They showed constant ratio gas air mixing, volume control, blast piloting, electrical failure protection, secondary air control, flame failure protection, remote ignition, and time and temperature control.

Carbomatic Corp., New York, showed an operating demonstration oven with four of their radiant heat generators in different locations to illustrate applications to various types of work at temperatures up to 2500° F. There was also an operating model of their infra-red radiant heat generator.

Eclipse Fuel Engineering Co., Rockford, Ill., had a combined burner display unit connected to demonstrate different types of industrial burners and their application to heat-treating and processing. A small gas direct-fired automatic semi-muffle shop furnace and a pot furnace for salt and lead hardening completed this exhibit.

Gas Machinery Co., Cleveland, showed silicon carbide radiant burner tubes, and silicon carbide rollers for roller hearth-type industrial furnaces in an attractive lounge.

These burners and rollers have been designed for operations up to 2500° F.

Gehnrich & Gehnrich, Inc., Woodside, L. I., demonstrated an air draw oven which operated at 1250° F., complete with automatic control equipment, that proved to be a center of attraction. In addition, this organization manufactures industrial ovens for baking, curing, drying and low temperature heat treating of ferrous and non-ferrous alloys. They were pioneers in treating magnesium castings during the war in direct fired ovens. Magnesium castings treated in the same manner today will find an infinite variety of uses in both the industrial and domestic fields.

Charles A. Hones, Inc., Baldwin, L. I., had two automatically-controlled heat-treating furnaces. One operated at 2000° F. and the other at 2400° F. for the entire period of the exposition fired by Hones' atmospheric burners. A temperature recording showed no deviation from the set temperature in spite of the hundreds of visitors who kept opening the furnace doors. A live display of various types of industrial burners and two small gas-fired pot furnaces attracted attention.

Intercontinental Engineers, Inc., Chicago, had a picture and poster display of some of their equipment and installations. This company not only builds gas-fired industrial furnaces, but also special machines, processing lines and complete plants.

C. M. Kemp Mfg., Co., Baltimore, which was at one end of the exhibit area, had an operating glass enclosed Kemp carburetor which could be adjusted by spectators themselves while observing the resulting gas flames. In another portion of the booth adjacent to their lounge a revolving modernistic display illustrated the flow of gases through the Kemp atmosphere generator.

Mid-Continent Metal Products Co., Chicago, Ill., manufacturers of industrial gas equipment, burners, blowers, mixers, regulators and air heaters had a few of their burners on a revolving display stand from the top of which a gas flame served to attract attention. A cut-away electrically lighted demonstration piece showed the flow of flame and flue gases of their home and industrial heating unit.

Selas Corporation of America, Philadelphia, Pa., in a large exhibit area had one of the most comprehensive operating displays. In addition to the line demonstrating their various types of high speed heating and radiant ceramic burners, the outstanding attraction of this company was an automatic rapid slug heating furnace for forging or extrusion. Fired by seven gas-fired radiant burners, and a special super-heat-type water cooled ejection burner, the 1″ x 1″ steel slugs were heated in six seconds.

Surface Combustion Corp., Toledo, at one end of the exhibit area, had as their theme a ten-foot atomic symbol of gas chemistry of prepared furnace atmospheres. On the revolving base under the symbol were samples of heat treated items done in various atmospheres. An item that attracted much attention was their Universal laboratory furnace in a vitreous enamel finish. It may be used as a direct-fired oven furnace at temperatures from 300° to 2400° F. as well as a muffle furnace by inserting the muffle on the hearth for indirect heating. A new piece of equipment demonstrated was an electronic dewpoint recorder which provides a means of obtaining closer control of the effects of water vapor in all types of furnaces utilizing gaseous atmospheres. A continuous record of humidity of the furnace atmosphere is accurately made for 24 hours on conditions from minus 70° F. to room temperature. A display of industrial burners, a scroll air heater, and a lounge area occupied the balance of this exhibit.

In addition to the exhibitors in the A. G. A. Combined Industrial Gas Exhibit there were many manufacturers of industrial gas equipment scattered throughout the two floors of the exposition which attested to the importance of gas for all industrial heating.

A. G. A. At National Power Show

A RECORD breaking crowd taxed the facilities and manpower assigned to the American Gas Association combined exhibit at the 17th National Exposition of Power & Mechanical Engineering, Grand Central Palace, New York, December 2-7.

The A. G. A. sponsored combined exhibit occupied more than 600 square feet with 44 feet of frontage along one of the four main aisles of the main floor. Done in the traditional blue and white motif, the association name spanned the entire length of the exhibit flanked on both ends by the well-known slogan, "More and More the Trend Is to Gas." One "trend chart" had the legend "The Ideal Fuel" and the other one had "Wherever Heat Is Required."

Some 30 industrial gas-fired units or pieces of equipment produced by 10 manufacturers were displayed in the combined exhibit. Eight pieces were operating to demonstrate the advantages and application of the particular products. The assortment was such that no matter what the specific heating needs of the visitor were, at least one of the units was designed for the type of job in which he was interested. Advanced equipment for heat treating, melting air heating, temperature control, steam generation, water heating and gas-air proportioning was shown.

The exhibits crowded the four floors of Grand Central Palace at this first postwar Power Show. All types of plant equipment in the power and mechanical field was displayed for the nearly 50,000 visitors. One noticeable innovation throughout the show was the wide use of transparent plastics for working models.

No less interest was shown in the live gas exhibits in the A. G. A. area. Thousands stopped to peer into the heat treating muffle furnace which operated continuously at 2000° F.

In addition to the muffle furnace which was fired with atmospheric burners, the temperature being recorded on a suitable instrument, a non-ferrous melting furnace was operating, tangentially fired, utilizing a low pressure air proportioning system.

The large and ever expanding field of hot air applications for tempering, core baking, product drying and curing was illustrated by

Exhibitors at A. G. A. combined exhibit at the National Power Show, Grand Central Palace, N. Y., December 2-7

means of installation photographs of many applications.

Recognizing the trend towards developing process steam in individual boilers serving individual production lines or machines, a 3 h.p. gas-fired boiler was included in the exhibit. There was also a live exhibit of miscellaneous refractory lined burners for various heating, heat treating and high speed operations.

The all important phase of control was represented by an exhibit of flow meters, regulators, and a live exhibit of protective and control apparatus. This attractive exhibit was a center of interest with the several gas flames mysteriously going on and off to illustrate the sensitivity and accuracy of the control equipment.

The cooperating firms manufacturing the equipment shown in the A. G. A. combined exhibit were: American Gas Furnace Co., Elizabeth, N. J.; Bryant Heater Co., Industrial Division, Cleveland, Ohio; Gas Appliance Specialties Co., Woodside, N. Y.; Gehnrich & Gehnrich, Inc., Woodside, N. Y.; Charles A. Hones, Inc., Baldwin, N. Y.; Mears-Kane-Ofeldt Inc., Philadelphia, Pa.; Mid-Continent Metal Products Co., Chicago, Ill.; The Partlow Corporation, Utica, N. Y.; Selas Corporation of America, Philadelphia, Pa.; and A. O. Smith Corp., Milwaukee, Wis. Representatives from Consolidated-Edison Company of New York, and The Brooklyn Union Gas Company assisted at the exhibit.

Utilization Schools

OF interest to the gas industry at large and to industrial and commercial gas men in particular, are two schools which will be sponsored by the Industrial and Commercial Gas Section, of the American Gas Association. Each of these schools will offer one-week courses to train men in the latest methods and equipment for gas utilization. The Industrial Gas School will be held May 5-9 at the Hotel Seneca, Columbus, Ohio, and The Commercial Gas School, May 12-16 in Washington, D. C., in the auditorium of the Washington Gas Light Co.

An outline of the courses will be sent to member companies and members of the Industrial and Commercial Gas Section, together with registration blanks and other pertinent information during January.

A long shot of the A. G. A. exhibit at the National Power show

Gas Breakfast Successful

ONE-HUNDRED fifty gas men, metals magazine editors, manufacturers of industrial gas equipment and representatives sat down together at the annual Industrial Gas Breakfast of the American Gas Association held during the National Metal Congress and Exposition, at Atlantic City, November 20.

Presiding at the head table was Karl Emmerling, The East Ohio Gas Co., Cleveland, newly-elected chairman of the Industrial and Commercial Gas Section, of A. G. A. When the breakfast was over, Mr. Emmerling introduced Earl Smith, president, Atlantic City Gas Co., who gave a few words of welcome on behalf of the gas company and the city. He was followed by E. E. Thum, editor of *Metal Progress,* who greeted the assembled guests on behalf of the American Society for Metals, sponsors of the National Metal Congress and Exposition.

The speaker of the morning was I. Stanley Wishoski, editor and publisher of *Industrial Heating.* Mr. Wishoski gave a down-to-earth talk on business and labor problems confronting the country today.

American Gas Association's Industrial Gas Breakfast at the Hotel Traymore, Atlantic City, N. J., November 20

gas grapevine

We wonder how many people saw Surface Combustion Corp.'s new Dew Point Recorder at the Metal Show in Atlantic City. This almost human electronic gadget is used in conjunction with prepared furnace atmosphere generators. It records the dew point of the atmosphere and is especially valuable when the moisture content of the gas must be maintained within narrow limits.

It was gratifying to see so many industrial gas men at Atlantic City. Almost every section of the country was represented. Those who attended got a lot out of this recent Metal Show which had many new features and a great variety of equipment on display.

Portland (Oregon) Gas & Coke Co. sends us a blurb about "The Hub" restaurant, a new establishment that uses gas 7 ways: 1—cooking; 2—broiling; 3—baking; 4—hot water and hotter water; 5—deep fat frying; 6—steam cooking; and, 7—heating!

They also tell about the new "White Rock" bottling plant that has a gas-fired water heater and a steam generator which team up to clean and sterilize.

Another item in the A. G. A. exhibit at the Metal Show was Gehnrich's new Air Draw Oven designed to operate up to 1250° F., gas-fired of course.

The Pacific Coast is really going to town on gas installations. Fosters, operating 22 restaurants and 11 retail bakeries in San Francisco and Oakland use gas in all their establishments. 107 water and coffee urns, 73 ranges, griddles and steam tables, 50 boilers and water heaters make up their restaurant appliance roster. An average of 45,000 meals are served daily.

Reubens, in New York, the guy that started out 30 years ago serving balloon sized sandwiches in his delicatessen, has just opened a swanky new place on 57th street. Gas is used for all cooking, and incidentally this 24-hour restaurant is located in the former gas company building.

a.q.s.

Commercial Cooking Maintenance Manual

THE American Gas Association has published a booklet entitled "Getting the Most Out of Your Gas Cooking Equipment," which is available without charge for distribution to commercial gas cooking customers.

Your customers who have a part in the large national business of cooking the 65,000,000 meals that are served daily in public eating places will be glad to receive a copy of this publication. It will help them obtain successful operation by maintaining the utmost efficiency through observing good housekeeping rules in kitchen operation as it contains recommendations on: Care and cleaning of cooking equipment; The proper adjustment of burners and controls; Sound economical practices in using gas cooking equipment.

Gas companies will find this booklet a useful tool to "Continue the Trend to Gas for all Commercial Cooking." Write A. G. A. headquarters for a supply for your customers.

Industrial Conference To Meet in Boston

THE American Gas Association's Sales Conference on Industrial and Commercial Gas will be held at the Copley Plaza Hotel, Boston, March 17-19, according to an announcement by Karl Emmerling, chairman, Industrial and Commercial Gas Section.

A program has been tentatively outlined by the Program Committee under the chairmanship of Harry A. Sutton, Public Service Electric & Gas Co., Newark, N. J. One day will be devoted to a commercial session, one day to an industrial session with one day in between to a combination of both and general subjects.

A reception to those attending the Conference will be sponsored by G.A.M.A. on Tuesday evening, March 18. The arrangements for this affair being in charge of Frank J. Fieser, F. J. Fieser Co.; Herman Gehnrich, Gehnrich & Gehnrich, Inc.; Harry O. King, Standard Gas Equipment Corp.; and Arthur Pitman, J. C. Pitman & Sons, Inc.

Beck Joins Grayson

A. W. BECK has been added to the sales staff of Grayson Heat Control, Ltd., Lynwood, California, according to an announcement by Hal Singleton, sales manager.

Mr. Beck was employed by the Southern California Gas Co. for eight years.

NOTE ON YOUR CALENDAR

A. G. A. Sales Conference on Industrial and Commercial Gas, March 17-19—Copley Plaza Hotel, Boston

National Restaurant Exposition, A. G. A. Commercial Gas Cooking Center, March 25-27—Hotel Stevens, Chicago

Industrial Gas School—week of May 5—Hotel Seneca, Columbus, Ohio

Commercial Gas School—week of May 12—Washington Gas Light Co., Auditorium and Lewis Hotel School, Washington, D. C.

National Metal Congress & Exposition, October 20-24—Amphitheater—Chicago

National Hotel Exposition, November 10-14—Grand Central Palace, New York

Garage Radiant Heated by Gas

One of the largest garages in the United States to be radiant heated is being completed in Ohio for the East Akron Nash Co. Coils of wrought iron pipe, embedded in the concrete floors and supplied with hot water from a gas-fired boiler, comprise the radiant heating system

Meeting Gas Loads

BY JOHN J. NOVY

The Peoples Gas Light and Coke Company, Chicago, Ill.

TWENTY years ago, Chicago and the adjoining towns were supplied by a combination of 530 B.t.u. coke oven gas and carburetted water gas. Judged by present-day standards, the house-heating load was negligible, so that the annual average daily sendout was about 101 MM cu. ft. and the maximum day was about 137 MM cu. ft. At that time we considered the coke oven gas to be the normal sendout, because it was used to satisfy the constant or base part of the load, while the production of carburetted water-gas was varied to meet peak loads by supplementing the coke oven gas in meeting customers' demands. Mixing and interchanging these gases was found not too troublesome from the appliance standpoint.

About 1930, several rather disturbing conditions appeared on the horizon. First of all, because of increases in our gas sales, we were having to use more and more of the carburetted water-gas capacity to meet base-load requirements, and were soon going to need additional production capacity. Second, indicated increases in househeating were forecasting such radical increases in the winter peaks that it would become increasingly difficult to meet maximum day demands, particularly since much of the water gas production capacity was already being used in meeting normal peak loads. Third, the costs of production of water gas were rising, due in no small part to increases in the cost, and decreases in the qualities, of carburetting oils available.

Change in Operations

In 1931, a 1,000-mile natural gas pipeline was completed to Chicago and we made a rather abrupt and rapid change in the nature of our operations. Instead of distributing about 60 percent coke oven gas and 40 percent carburetted water gas, in October of 1931 we started to distribute an 800 B.t.u. mixture containing 45 percent coke oven gas and 55 percent natural gas. To effect this change required a citywide adjustment of customers' appliances. The selection of this B.t.u. standard was a compromise of providing a supporting load on the pipeline and preventing waste of steel mill coke oven gas covered by purchase contracts.

The initial deliveries of natural gas by the pipeline were about 75 MM cu. ft. per day (thermally equivalent to the outputs of 25 or 30 carburetted water gas machines) so that this conversion from manufactured gas distribution, to distribution of a natural gas mixture, provided an increase in sendout capacity that was needed. Also, the increase in thermal content of the sendout gas provided a 50 percent increase in the capacity of existing pumping, regulating and storage equipment. Further, the cost per therm of the natural gas was considerably lower than that of carburetted water gas.

Mixed Gas Problems

Changing from 100 percent manufactured gas to a mixture of manufactured and natural gas presented us with some new problems. First of all, the change concentrated practically all of our mixed gas sendout capacity at two points near the city limits. We had to modify the carburetted water gas machines in our centrally located stations to produce 800 B.t.u. gas for peak periods and emergencies.

Before 1931, our operations were relatively simple—we distributed mostly coke oven gas, supplemented by increasing volumes of carburetted water-gas. But after 1931 when the operations became more complex, a mixture of two very different types of gas was sent out and it was necessary to provide a secondary source of supply for each of the two components. It was also desirable to develop means of producing gas that could be used to supplement the 800 B.t.u. mixture directly.

Part of the original carburetted water gas capacity was kept in condition to produce 530 B.t.u. gas to supplement our coke oven gas production. To supplement the natural gas supply, or replace it in emergencies, we installed storage of 700,000 gallons of butane at the natural gas delivery points. The central station water gas equipment was converted to the manufacture of 800 B.t.u. gas, in order to provide us with a source of gas that could be used to supplement the mixture normally sent out, particularly during peaks or when the supplements for the primary gases (i.e., the butane and 530 B.t.u. carburetted water-gas) were insufficient.

The adoption of a natural-manufactured gas mixture as a sendout, and the installation of sources of supply to supplement the constituents of the sendout mixture, provided us with ample capacity to meet all demands for gas for a number of years after 1931. In the earlier years we operated each of the 800 B.t.u. manufacturing plants for a week or so, mainly to keep them in condition and provide the personnel with necessary experience. In later years, increases in load, interruptions in deliveries of natural gas from the pipeline, or of coke oven gas from steel companies, necessitated operation of these secondary sources.

Economy dictated the use of natural gas for reforming to produce a supplement to coke oven gas and a substitute for carburetted water-gas. After we got into reforming operations we found, as had many others, that not only was reforming useful as a means of increasing our summer consumptions of natural gas, but they were also valuable in meeting minor peak loads.

Extending Lines

One of our carburetted water gas machines could produce about 175 M cu.ft. per hour of 530 B.t.u. oil-gas. But when used in reforming operations, that same machine could produce 300 M cu.ft. per hour of 550 B.t.u. per cu.ft. gas, which, when mixed with an equal volume of natural gas, would provide 600 M cu.ft. per hour of 800 B.t.u. per cu.ft. mixture. This, and other considerations, prompted us to extend natural gas supply mains across the city to the four central stations, and to alter several machines in such stations so that they could be used to produce either water-gas from 500 to 800 B.t.u., or 500-600 B.t.u. per cu.ft. reformed natural gas. This improved appliance operation since reformed gas is more like coke oven base gas than is water-gas.

The period 1931-1946 was one of continuously increasing sendouts and rapidly developing peak loads in Chicago. In 1931-1932, (i.e., after the change in sendout standard to 800 B.t.u.) the average daily sendout was 82.5 million cu.ft., and the maximum day was 114 million cu.ft., as compared with a maximum day of 176 million cu.ft. on manufactured gas. Last winter we had a maximum day of 254.2 million cu.ft., as compared to an average day of 155 million cu.ft. All of the data in this paper pertain to sendouts in our

Part of a Symposium on Meeting Gas Loads, presented at the 28th Annual Convention of the American Gas Association, Atlantic City, October 7-11.

system to the general public in Chicago and adjacent towns and do not include interruptible sales of natural gas.

Since 1931, our annual average day has increased 66 million cu.ft. or 80 percent by volume and 120 percent in therms, and our maximum day has increased 140 million cu.ft. or 123 percent by volume and 185 percent in therms.

Earlier it was mentioned that in the manufactured gas days of 1928 or 1929 our sales were increasing so rapidly that the carburetted water gas production capacity which had been available for supplementary or peak load operations, was being used more and more for normal or base load sendouts. Similarly, in recent years, sales have increased to such an extent that we have gradually been using more of the production capacity originally used for supplementary or peak loads, to meet normal or base loads. To balance these increases in production of low B.t.u. components, natural gas deliveries by the pipeline were increased by several boosts in operating pressure and by a looping program which is partially completed. At present the general procedure that we use to meet various degrees of demand is as follows:

During summer months we purchase and produce coke oven gas, and mix it with natural gas, to send out a 45/55 mixture containing 800 B.t.u. per cu.ft. Also, to improve pipeline loading during the summer, we sell volumes of off-peak mixed gas on a firm basis and appreciable natural gas through separate special mains to several large industries on an interruptible supply basis.

As the sendouts increase in the fall and early winter, part of the natural gas sold on an interruptible basis is diverted to sendout mixtures. Since we cannot greatly increase the coke oven gas supply, it is augmented by first, 550 B.t.u. reformed gas and then by 550 B.t.u. water-gas.

When loads become heavy, all interruptible sales of natural gas are stopped; part of such gas is reformed, and part is used for enrichment. Some 530 B.t.u. carburetted water-gas may be produced in the central stations and enriched by natural gas, or a few of the central station machines may be used to produce straight 800 B.t.u. per cu.ft. gas in addition to a reformed-natural gas mixture. In the event that the requirements of natural gas for reforming and central station operations does not leave enough for admixture with the coke oven gas produced and purchased at the city limit stations, the butane and propane stored there may be used as a supplementary enricher.

We go to considerable trouble to avoid or reduce substitution of one gas for another. For example, when 800 B.t.u. gas is manufactured in a central station it is mixed with as much of the normal coke oven and natural gas sendout mixture as can be made available by filling the station holder during the night hours. Gases from our secondary sources of supply are usually added to the normal sendout; they are supplements rather than substitutes or replacements. By avoiding any operations which cause the normal contents of our mains to be replaced by some other mixture, we minimize any effects of differences in the gases on the operation of customers' appliances. There have been emergencies in which we were not able to avoid substitution or replacement in certain parts of our system —they will be mentioned later.

Mixtures Are Acceptable

Both laboratory tests, and our experience in the field, indicate that the mixtures we use to supplement our normal sendout, would be acceptable substitutes for an 800 B.t.u. mixture of natural gas and coke oven gas. An 800 B.t.u. mixture of reformed natural gas with natural gas has been used as a successful replacement of the normal gas, and a coke oven gas enriched to about 830 B.t.u. by admixture of propane or butane plus about 10 percent natural gas has also been satisfactorily used. When the gravities of the supplementary mixtures are appreciably greater than those of normal sendout, the gas mixture is increased in heating value in order to retain approximately the same burner input factor. Although we may make up mixtures of natural gas and 530 B.t.u. carburetted water gas so as to contain 815-820 B.t.u. per cu.ft., we try to restrict the concentration of such mixtures in our sendout to below 75-80 percent. Also the so-called 800 B.t.u. carburetted water-gas may actually contain 840-850 B.t.u. to improve its burning characteristics; its concentration in the sendout is restricted to below 50 percent if possible.

First Attempts at 800 B.t.u. Gas

In 1933 our first serious attempts to manufacture an 800 B.t.u. gas as a supplement for the normal sendout mixture resulted in a carburetted water gas, containing 45-50 percent of water-gas and about 45 percent of 1400 B.t.u. oil-gas. This gas was too heavy to be of much use to us, having a gravity of 0.7 as compared to the normal 0.54. Burner tests and plant studies led to the conclusion that the gravity of this gas could be reduced, and the burning character improved, to an extent that would permit it to be used as a substitute for normal sendout, by reducing the water-gas content below 15 percent and cracking the oil gas down to 1100-1150 B.t.u. per cu.ft. This could be done by reducing the steam input, raising checkerwork temperature, and putting a larger percentage of the oil through the fire-bed. We were able to produce an 810-820 B.t.u. oil gas having a gravity of 0.575 which could be rated as an 80 percent substitute for our normal sendout —that is, it might be used to supplement our normal sendout in concentrations up to 75-80 percent. The rate of production per machine was low (100-110 M cu.ft. per hour versus 160 M cu.ft. per hour), the oil efficiency was low (10-12 gals. per M cu.ft. versus 8-9 gals. per M cu.ft.), and there was considerable difficulty in keeping wash-boxes from being fouled or plugged by a paste of tar and lampblack.

From 1933 to 1936 we made full scale production tests of several patented processes, the refractory screen process, the reverse-air-blast process, the back-run process, etc. In these plant tests we were able to produce 800-825 B.t.u. gases that were adjudged acceptable in nature, at reasonable cost, and at desired rates. But, for reasons peculiar to our own conditions and plans, we did not adopt or use any of these processes for regular operations. Each of these processes required alteration of our equipment in such a manner as to limit operation of the equipment to that particular method of production. We already had plans for extending natural gas supply to our central stations, and did not wish to commit ourselves to making 800 B.t.u. gas in any manner that would prevent our using the same machines for natural gas reforming and the production of ordinary 530 B.t.u. carburetted water-gas.

The final result of several years of testing processes for producing 800 B.t.u. gas in our water gas machines was a compromise between a true carburetted water gas containing 40-50 percent water-gas and a true oil-gas containing less than 10-15 percent water-gas. Our so-called 800 B.t.u. manufactured gas actually contains 840-850 B.t.u. per cu.ft., is of 0.63-0.64 gravity, and contains 25-30 percent of water-gas and 60-65 percent of 1200-1250 B.t.u. oil-gas. We can make this

"Charlie's Way"

● It's getting so that everyone around the plant is avoiding Charlie Mitchell.

Charlie Mitchell isn't his name. He's one of the most conscientious and valued workers in the organization—and is rapidly becoming one of the most inefficient. He has an idea that not a thing can be done without his checking it. Knowing this, his subordinates aren't as careful as they would be if the responsibility were entirely theirs. They know that if there is a slip or a mistake that Charlie will check it. Often a well-done job has to be done over again because every move in doing it wasn't exactly "Charlie's way." He is stifling the initiative and the enthusiasm of everybody under him.

The other department heads keep away from him. They no longer like to go to lunch with him. He carries all his problems with him wherever he goes and his friends are getting sick of hearing about his work, his problems and the shortcomings of his personnel.

He hasn't developed a man in his department to step in and take his place, although several of them could measure up to it if they were given half a chance. Some day he is going to crack—blow up because he has the idea that he is indispensable.

Is Charlie Mitchell conscientious? Yes, painfully so. Is he loyal to the company? There is absolutely no question about this. Is he a good executive? No, because he isn't willing to delegate responsibility nor to share authority.

Trained Men.

gas in an ordinary water-gas machine with a minimum of structural alterations, just inserting an oil spray in the generator and enlarging the wash-box drain. Many of the three-shell and Williamson machines in our plants, originally designed for 530 B.t.u. carburetted water-gas, can be readily and easily switched back and forth from productions of 530 B.t.u. carburetted water-gas, 550 B.t.u. reformed natural gas, and 850 B.t.u. carburetted water-gas. This flexibility, coupled with the aforementioned practice of supplementing rather than substituting, has been an important factor in our ability to readily meet varying demands.

Many of us in the Chicago company have the feeling that up to now we haven't had any peak load operations. At any rate we haven't engaged in any operations specifically designed or planned to meet only peak demands.

But the near future presents a different picture. In the winter of 1943-44 our maximum day was 213 MM cu.ft.; in the winter of 1944-45 the maximum day was 242 MM cu.ft.; last winter the maximum day was 254.2 MM cu.ft.; this coming winter we anticipate a maximum day of 297.5 MM cu.ft. As many of you know, this summer we obtained permission from the Commerce Commission to refuse applications for house-heating and large industrial consumption until April, 1947, and to curtail deliveries of firm gas to large industries when the supply to domestic consumers is threatened. But even with these concessions, it may be necessary to undertake operations that are of a truly peak load nature in the coming winter.

During the steel strike last spring, the receipts of coke oven gas was only about 25 percent of normal. This emergency was met by using one of the two mixers to prepare a 920 B.t.u. per cu.ft. mixture of natural gas and air, which was used to supplement the reduced sendout of coke oven gas and natural gas.

During the past summer, studies in our own laboratories, using 14 representative appliances, have convinced us that mixtures of butane and air, or of propane and air, might be used to supplement our normal sendout. These tests indicated it to be possible to use up to 45 percent of an 1150-1200 B.t.u. mixture of air and butane, and up to 100 percent of an 1119-1270 B.t.u. mixture of air and propane, in mixture with the normal coke oven and natural gas sendout, without serious effects on the operation of customers' appliances.

In the past 20 years our average daily sendout in therms has doubled, and our maximum daily load has practically trebled—but to date we have been able to meet these increases without major investments in gas manufacturing equipment:

1. By utilization of natural gas mixing.
2. By modifying existing equipment so that it can be used to produce two or three different kinds of gas from either natural gas or gas-oil.
3. By carefully selecting procedures or processes that will provide us with gases of high substitutability for our normal sendout, but endeavoring to use such gases as supplements rather than as substitutes.

In view of estimates of maximum days of 297 million, 304 million, 340 million, and 380 million cu.ft. in successive years, the need of additional capacity is indicated, and more substitution instead of supplementation appears inevitable.

Safety Messages Prove Effective

LAST September the Accident Prevention Committee of the American Gas Association, Howard T. Jayne, chairman, resumed the long-established but war-interrupted service of sending "Foreman's Safety Messages" to gas company members at regular intervals. The entire series was reviewed by the committee which retained the most effective, modifying them where necessary to bring them up-to-date.

This material is being widely used in messages to company personnel. For example, R. F. Hinchey, vice-president and general manager, West Texas Gas Co., Lubbock, Texas, comments: "We appreciate this series of Safety Messages very much. Our properties are spread over a large area with comparatively few large towns." How that company utilizes this service is illustrated in the following letter to all employees of the company, signed by Mr. Hinchey, which is based on A. G. A. Safety Message No. 3-46:

"It is a generally accepted conclusion that the human elements are a more important factor in our safety program than are the mechanical elements.

"Any experienced safety minded employee is an important factor in our safety program. Both by example and by active and continuous educational work, he can effectively assist in the development of new employees into safety conscious men.

"Attitude, thought and habit are three of the mental factors directly related to safety.

"The training of new employees in safety is as important as training them for the position. It is desirable that safety instructions be a part of the instructions given every new employee. Safety examples in any safety program speaks louder than words.

"Often the man who tries to practice safety may not have the knowledge, imagination or analytical ability to notice and avoid dangers, hence, constant safety instructions are necessary in connection with existing hazards.

"Safety instruction is by its very nature a never ending process. It may seem tedious, but to any conscientious employee it is not only a duty but a challenge to exert his greatest effort for the safety of his association."

Motor Vehicle Program

A PROGRAM to assist operators of public utility motor vehicles was laid out at the organization meeting of the 1946-1947 Motor Vehicle Committee of the Technical Section, American Gas Association, which took place November 19, in New York. B. D. Connor, superintendent of transportation, Boston Consolidated Gas Co., and chairman of the committee, presided at the meeting.

Considerable interest was shown by the committee in power-driven construction equipment such as diggers, tractors, backfillers, compressors, etc., and it was decided that a joint subcommittee of the Distribution and Motor Vehicle Committees should be formed to study such equipment. Also discussed at length were chronic failures or "bugs" in new cars and trucks. Both these subjects will be discussed further at the Spring Motor Vehicle Conference.

Subcommittees on "Standardization of Truck Bodies," Sidney F. Gale, New Orleans Public Service Inc., chairman, and "Driver Training," Linn Edsall, Philadelphia Electric Co., chairman, will continue their important studies.

Plans for the 1947 convention and the Spring Conference are being perfected by the Program Committee under the chairmanship of R. H. Clark, Consolidated Edison Co. of New York, Inc., chairman.

Directory of Corrosion Workers Revised

THE American Coordinating Committee on Corrosion is undertaking a revision of its confidential directory of technologists actively engaged in studies on corrosion and its prevention. The committee comprises delegates from 17 major technical societies together with representatives from the principal industrial research institutes and other organizations such as the National Bureau of Standards.

The directory currently lists some 500 investigators in a diversity of specialized fields selected on the basis of questionnaires circulated to the membership of the committee's member societies. While it is felt that the directory list is relatively complete there are undoubtedly individuals who were not reached in the previous circulations. Accordingly, the committee now requests all persons actively engaged in corrosion researches who have not been contacted to wire the secretary, Professor Hugh J. McDonald, Illinois Institute of Technology, Technology Center, Chicago 16, Illinois, for further details and application forms for directory listings.

Laboratories

ARTHUR F. BRIDGE, Chairman

R. M. CONNER, Director

Requirements Committees Review Appliance Standards

FOUR approval requirements groups recently met at the Laboratories for review, revision and adoption of appliance standards, in keeping with industry needs.

The domestic range committee during a two-day meeting considered revised wall and floor temperature requirements in the light of industry criticisms and approved them for final action. It also adopted proposed requirements for dual oven-type combination ranges as well as suggested provisions for venting of gas ranges. Both will be printed and distributed for criticism. Consideration was also given to single point ignition and suggested changes adopted for comment by interested groups.

Use of aluminum jackets was thoroughly discussed by the water heater group, which decided they could be accepted provided all tests were met and proper protection provided. Research was recommended to determine feasibility of interchanging different types of insulation without need of retest. Other subjects discussed included accessibility for cleaning of copper coils of circulating tank heaters and provisions of new requirements covering automatic pilots.

Proposed requirements for industry criticism were adopted by the bake oven committee, these including tests for high altitude operation. It was agreed that further study should be given to baking tests to make these more indicative of actual field conditions.

In addition to adopting proposed revisions to present standards for presentation to the industry, the space heater group also considered new designs recently submitted for approval. Agreement was reached on the method of their testing to cover special features presented.

Bridge Named Laboratories Managing Committee Chairman

Arthur F. Bridge

Charles E. Bennett

George F. Mitchell

Elmer F. Schmidt

ARTHUR F. BRIDGE, vice-president and general manager, Southern Counties Gas Company of California, has been appointed chairman of the Managing Committee of the American Gas Association Testing Laboratories by President R. H. Hargrove.

Charles E. Bennett, president, The Manufacturers Light & Heat Company of Pittsburgh, has been named vice-chairman, a newly created post to facilitate handling of Laboratories activities.

Wider geographical representation has also been achieved by appointment of two additional members: George F. Mitchell, president, The Peoples Gas Light & Coke Co., Chicago, and Elmer F. Schmidt, vice-president and operating manager, Lone Star Gas Co., Dallas.

Mr. Bridge succeeds George E. Whitwell, vice-president in charge of sales, Philadelphia Electric Co., a member of the committee for 18 years and chairman for the past five years. Mr. Whitwell, in spite of pressure of other duties, retained the chairmanship throughout the war. He has consented to continue as a member of the committee.

Mr. Bridge is a graduate of the University of California with both a B.S. and M.S. in electrical engineering, obtaining the latter in 1913. He then served as assistant engineer in the Gas and Electric Division of the California Railroad Commission until 1917.

A veteran of World War I, Mr. Bridge served in France, Germany and Belgium, with engineering units as a Captain. During the armistice period he was a member of a military mission to evaluate war damages in Belgium. He became associated with the Southern Counties Gas Company in 1919, and after serving in various engineering capacities was promoted to vice-president in 1928. For many years he has been prominent in affairs of the American Gas Association and served as its president in 1943. He has been a member of the Laboratories Managing Committee almost 17 years.

Member Eight Years

Mr. Bennett has been a member of the committee since 1938. He entered the gas industry in 1915, holding various executive positions with Madison Gas & Electric Co., Binghamton Gas Works, Columbia Engineering and Management Corp., Home Gas Co., Keystone Gas Co., Eastern Pipe Line Co., Reserve Oil Corp., and Consumers Natural Gas Co. For the past 10 years he has been located in Pittsburgh as president of the Manufacturers Light and Heat Company. He was graduated from the University of Wisconsin in 1912 as a mechanical engineer.

Mr. Mitchell entered the utility field in 1909 with the Commonwealth Edison Co. of Chicago. He joined The Peoples Gas Light and Coke Company in 1919 as assistant to the chairman of the board, becoming president in 1930. Mr. Mitchell is a graduate of Armour Scientific Academy. Active in American Gas Association affairs, he served as second vice-president in 1940, prior to which he was a director, and in 1941 was vice-chairman of the Committee on National Advertising. His appointment renews his company's participation in management of the Laboratories, the late Robert B. Harper who helped to establish them, having been a charter member of the committee.

Mr. Schmidt was graduated from Cornell University in 1912 as a civil engineer. Following his graduation he was associated with various utility companies, prior to joining the Lone Star organization in 1918. In 1935 he was elected vice-president and a director. He is now in charge of production and transmission operations of his company, comprising one of the largest natural gas systems in the southwest.

Aided Meter Development

Mr. Schmidt aided materially in developing the orifice meter recording mercury differential gauge for high pressure gas measurement and the gas density balance used widely today in determining specific gravity of natural gas. He was chairman of the Natural Gas Department of the American Gas Association in 1940. At present he is vice-chairman of Committee D-3 on Gaseous Fuels of the American Society for Testing Materials and chairman of Subcommittee D-3-IV on Determination of Specific Gravity and Density of Gaseous Fuels.

Range Committee Honors Winterstein

C. C. Winterstein receiving desk set from K. R. Knapp, Laboratories assistant director, as Chairman O'Donnell looks on

AT its initial meeting under the chairmanship of Charles H. O'Donnell, the Subcommittee on Approval Requirements for Domestic Gas Ranges honored its retiring chairman, C. C. Winterstein.

The committee presented Mr. Winterstein with a desk set bearing an inscription acknowledging his long and faithful service. Mr. Winterstein recently completed 21 years as its chairman, having served continuously since its organization in 1925 by the American Gas Association, shortly after the establishment of the Laboratories. Prior to that time he was active in predecessor groups interested in gas appliance standardization, out of which the present committee grew. In fact, steps taken by his company in Philadelphia towards the preparation of range specifications in 1903 appear to represent the earliest recorded activities of such kind.

Graduating from the University of Pennsylvania in 1910 with the degree of B.S. in Mechanical Engineering, Mr. Winterstein immediately entered the employ of The United Gas Improvement Company. Assigned to utilization work, he soon became manager of its Appliance Laboratory. For the past several years he has served The Philadelphia Gas Works Co., an affiliated organization, in the same capacity. During this period he has not only built an outstanding reputation as an appliance specialist and authority on utilization, but most ably guided formulation and adoption by first the A. G. A. and secondly the American Standards Association of today's excellent gas range standards.

Retiring from the gas range subcommittee, Mr. Winterstein will continue to serve on other requirements groups. He remains a member of the Approval Requirements Committee, on which he has also served continuously since 1925.

The committee's new chairman, Mr. O'Donnell, Boston Consolidated Gas Company, is experienced in committee work, being a member of both the water heater and domestic range requirements subcommittees, as well as the Technical Advisory Group on Domestic Cooking Research. He has been active in the gas industry since 1922, following his graduation from Massachusetts Institute of Technology. He entered the business with the Lowell Gas Light Co. and joined Boston Consolidated in 1928 as manager of its House Heating Department.

Mr. O'Donnell has been active for many years in the New England Gas Association, serving in the Industrial and Sales Divisions, being chairman of the Industrial Division in 1932 and 1933. In 1944 he was chosen to head his company's Sales Development Division and to manage the General Sales Office.

Consumer Booklet Issued

A SMALL, four-page pictorial consumer booklet on testing and approval activities of the American Gas Association Testing Laboratories has been issued by the Laboratories' Managing Committee.

Bearing the title "Protecting Consumers—Seal of Tested Gas Appliances," the new booklet is in three colors. Concisely written it explains the meaning of the Laboratories Approval Seal to the consumer and presents pictorially testing and inspection operations.

The booklet is designed for distribution by gas companies, manufacturers, and dealers and may be obtained from the Laboratories at three dollars per hundred. It has been made available in connection with the widespread consumer interest in approved gas appliances.

New consumer booklet designed for distribution by utilities, manufacturers and dealers

Associated Organization Activities

P. U. A. A. Area Meeting Held

CHARLES J. ALLEN, president of the Public Utilities Advertising Association, and Harold S. Metcalfe, vice-president of the organization, were among principal speakers at the first of the current year's P. U. A. A. area meetings held in the Hotel Biltmore in Atlanta, November 5.

During the morning session, which was presided over by Roy Knox, P. U. A. A. secretary and sales promotion and advertising manager for the Birmingham Electric Company, McCall awards for the promotion of gas-equipped kitchens were presented the Atlanta Gas Light Co., the New Orleans Public Service Co., and the Alabama Gas Company. The advertising campaign conducted by the Atlanta Gas Light Co., winner of first prize in the McCall contest, was discussed by F. C. Terrell, sales promotion manager for the company.

Other speakers on the program were J. T. Coatsworth, commercial director for the Edison Electric Institute; S. E. Weimer, advertising director, South Carolina Electric and Gas Co.; J. M. Stafford, advertising manager, Georgia Power Co., and Bernal Clark, advertising manager, Florida Power and Light Company. The afternoon session of the meeting was presided over by C. M. Kilian, advertising manager, Alabama Power Company.

Texas Manufacturers Elect C. L. May

CHESTER L. MAY, vice-president in charge of distribution properties, Lone Star Gas Co., was elected president of the Texas Manufacturers Association at the annual meeting in Dallas.

Mr. May was born in Lima, Ohio, and went to Texas in November, 1916, to make an inspection of Lone Star properties. In 1921 he was made general superintendent of what was then known as the Farmers Gas Co. which constructed 25 distribution plants along Lone Star pipe line. Then in 1925 the Community Natural Gas Co. was organized and absorbed the Farmers Gas Company. He was appointed general superintendent of the new organization.

In 1929 Mr. May was elected vice-presi-

dent and general manager of Community Natural. In 1933 the old Stamford and Western Gas Co. was merged with Community Natural, and in 1933 the Municipal Gas Co. was added to the system, all being placed under Mr. May's supervision as general manager. In 1944 Mr. May was elevated to his present position as executive vice-president in charge of all distribution properties in the Lone Star System.

Southern Gas Plans 36th Annual Convention

Dean A. Strickland

AT a meeting of the Southern Gas Association Executive Committee in Biloxi, Miss., December 5, plans and program for the 36th Annual Convention were formulated and approved. Slogan of the convention will be "Set Sails for Sales."

President Dean A. Strickland announced that the convention will be held in Biloxi, Miss., April 17-18, with headquarters at the Buena Vista Hotel.

M. H. North

M. H. North, chairman, General Convention Committee, presented the tentative convention program as prepared by the Convention Committee.

The general sessions will be held on the mornings of April 17 and 18 and will include addresses by speakers of national reputation, among which will be R. H. Hargrove, president, American Gas Association, H. Carl Wolf, managing director, A. G. A., and Clayton Rand, philosopher and humorist. Subjects to be included on the general sessions are: "The Future Outlook for Management and Labor," "Production Trends for 1947-48," "An Appraisal of our Industry's Opportunities," and "The A. G. A. Program for 1947-48."

Other subjects will be announced at a later date. The general sessions will also include an address by President Dean A. Strickland and a report from Managing Director Robert R. Suttle.

Sectional meetings to be held on the afternoons of April 17 and 18 include sales, operating, industrial and commercial, accounting, home service and accident prevention topics.

It was also announced that the Southwest Personnel Conference will hold its Spring meeting in conjunction with the Southern Gas Association Convention.

N. E. G. A. Safety Conference

ABOUT 150 gas men attended the New England Gas Association's Safety Conference December 10, at the Boston Consolidated Auditorium, Boston, Mass.

The first speaker at the morning session was Alfred L. Dowden, Liberty Mutual Insurance Co., who presented "Lessons from Experience," showing pictures that illustrated several recent cases involving asphyxiation, fire and explosion in New England and elsewhere. This was followed by "Safety Precautions When Installing Propane-Air Mixtures," given by L. R. Wenzel, Gas, Inc., Lowell, Mass., and "Demonstration of Fire Prevention," by Theodore W. Gunn, New Hampshire Board of Fire Underwriters.

Clifford E. Hall, American Gas Association, started off the afternoon session with a description of developments in the A. G. A. research and promotional program entitled "Our Industry Is on the March." The presentation was followed by an address by Vincent Parisi, Brockton Gas Light Co., titled "The Foreman's Responsibility in Good Housekeeping." The conference concluded with the paper "Safety and the Human Mind," presented by F. Alexander Magoun, Massachusetts Institute of Technology.

I. N. G. A. A. Elects Officers

JOSEPH BOWES, president, Oklahoma Natural Gas Co., Tulsa, Okla., was elected president of the Independent Natural Gas Association of America on November 22. Mr. Bowes succeeds E. Buddrus, president, Panhandle Eastern Pipe Line Co., Chicago, Ill., who retired after directing the affairs of the Association since it organization in 1944.

Other officers, all of whom were re-elected, are: Paul Kayser, president El Paso Natural Gas Co., El Paso, Texas, first vice-president; J. H. Dunn, president, Shamrock Oil & Gas Co., Amarillo, Texas, second vice-president; and F. W. Peters, treasurer, Oklahoma Natural Gas Co., Tulsa, Oklahoma, treasurer.

Gas Measurement Short Course

REPRESENTATIVES of the natural gas industry from 12 states attended a General Committee Meeting of the Southwestern Gas Measurement Short Course in Houston, Texas, November 11.

R. M. Scofield of the Lone Star Gas Co., Dallas, general chairman, presided. Dates of May 6-8 were set for holding the 1947 school at the University of Oklahoma, Norman, Oklahoma.

Other business of the meeting included the election of committee chairmen and action on recommendations of the Executive Committee. Committee chairmen elected were as follows: Program Committee, E. C. McAninch, Oklahoma Natural Gas Co., Ardmore, Okla.; Publications Committee, W. H. Woods, Gulf Oil Corp., Houston, Tex.; Exhibits Committee, George E. Greiner, Phillips Petroleum Co., Bartlesville, Okla.; Practical Methods Committee, chairman: B. F. Worley, United Gas Corp., Houston, Tex., and vice-chairman: J. L. Griffin, Northern Natural Gas Co., Omaha, Neb.; Registration and Publicity Committee, Kate A. Niblack, Oklahoma Utilities Association, Oklahoma City; and Local Arrangements Committee, W. H. Carson, University of Oklahoma, Norman.

The next meeting of the General Committee will be held in Oklahoma City, January 13.

Mid-West Personnel Group Elects Sedgwick

D. L. Sedgwick

AT a meeting of the American Gas Association Mid-West Personnel Conference held in St. Louis on November 19, D. L. Sedgwick, superintendent of gas operations, The Kansas Power and Light Co. with headquarters in Salina, Kansas, was elected chairman to succeed C. C. Jolley, personnel director, Natural Gas Pipeline Co. of America. Vernon Myers, manager, Insurance Department, Iowa Public Service Co., Sioux City, Iowa, was elected vice-chairman of the group; while H. H. Duff, personnel director, Panhandle Eastern Pipe Line Co., Kansas City, Mo., was re-elected secretary.

A product of the Bradley Institute, Mr. Sedgwick has spent his entire business career in the gas business. He served with the 75th Railroad Artillery in World War I, and with the War Production Board Power Branch during the recent war.

The Mid-West Conference is made up of the executives in charge of industrial relations of the gas companies in the Mid-West, and meets about eight times a year to discuss common problems.

Adams on Safety Council

W. H. ADAMS, safety director of The . Manufacturers Light and Heat Co., has been elected a member of the executive committee for the public utilities section of the National Safety Council. The election of the gas company executive took place at the recent 34th National Safety Congress in Chicago. Mr. Adams has been with the Pittsburgh Group of natural gas companies in the Columbia System since 1905.

Mid-West Annual Meeting

THE Mid-West Gas Association's 42nd Annual meeting and convention will be held at the Hotel Paxton, Omaha, Neb., April 7-9, it was announced by E. C. Deane, president. E. J. Otterbein, vice-president of the Association is in charge of the program.

Personal and Otherwise

Two New Men on A. G. A. Ad Team

Clayton G. Cassidy

J. H. Gumz

RECENTLY elected to the Industrial and Commercial Gas Advertising Committee are Clayton G. Cassidy, advertising manager, The Peoples Gas Light & Coke Co., Chicago, Ill.; and J. H. Gumz, manager of commercial and industrial sales, Pacific Gas & Electric Co., San Francisco. Mr. Cassidy is also a member of the Subcommittee on Approval of Domestic Gas Copy.

Friedman Appointed To Water Heating Group

Arthur Friedman

ARTHUR FRIEDMAN, vice-president of The Cleveland Heater Co., Cleveland, Ohio, has been appointed chairman of the American Gas Association's Technical Advisory Group for Gas Water Heating Research it is announced by F. M. Banks, chairman of the Committee on Domestic Gas Research. The appointment was made on recommendation of the Gas Appliance Manufacturers Association. He succeeds L. R. Mendelson.

Widely known in the water heater industry for more than 35 years, Mr. Friedman has been active in A. G. A. affairs since its organization. He was a member of the original Committee on A. G. A. Approval Requirements for Gas Water Heaters and has been a member of the Technical Advisory Committee for Gas Water Heating Research for several years. He is also a member of the Water Heating Committee of the Residential Gas Section and the Requirements Committee for Draft Hoods.

Mr. Friedman is a graduate in mechanical engineering of the Case School of Applied Science. He has personally donated to Case School a complete Gas and Fuel Laboratory for the Fuel Engineering Courses. He is also sponsoring, through his company, a research project at Case on internal corrosion of hot water steel storage tanks.

In addition to the gas associations, he is a member of the American Society of Heating and Ventilating Engineers, the Ohio Society of Professional Engineers, the Cleveland Engineering Society and the National Society of Professional Engineers.

Mr. Friedman's work as chairman of the Technical Advisory Committee will consist of screening proposed projects, and following through on the technical phases of projects that have been assigned by the Committee on Domestic Gas Research.

Cook Elected to A. G. A. Board

Henry R. Cook, Jr.

HENRY R. COOK, JR., vice-president, Consolidated Gas Electric Light and Power Co. of Baltimore, Baltimore, Md., was elected a director of the American Gas Association at the December 4 meeting of the board of directors, according to an announcement by R. H. Hargrove, president. Mr. Cook will fill the unexpired term of the late Charles M. Cohn.

Upon graduation from Stevens Institute of Technology in 1905, Mr. Cook entered the gas industry with the Public Service Corporation of New Jersey. Prior to joining Consolidated Electric Light and Power Co. of Baltimore in 1918 as assistant chief engineer of gas operations, he was employed for 10 years by the United Gas Improvement Co. of Philadelphia. Shortly after going to Baltimore Mr. Cook became general superintendent. In 1938 he was elected vice-president and in 1943 a director.

Crowell Appointed Director

A. H. CROWELL, Jackson, Mississippi, well known in the natural gas industry, has been appointed to the post of director of the production division of the Oil and Gas Division of the Department of Interior, it has been announced by acting Director Ralph K. Davies.

Mr. Crowell has been director of the Mississippi Oil and Gas Engineering Committee since January, 1945, and has had many years of experience with various phases of the petroleum and natural gas industries.

Bains Retires, James Advances at Harrisburg

George B. Bains

GEORGE B. BAINS, III, manager, Operating Department, Harrisburg Gas Co., since March, 1922, retired as of December 31. He is succeeded by Richard L. James, formerly assistant manager.

Mr. Bains has been in the gas industry over 48 years, and has the longest record of service with the company and its affiliates, of any employee in the Harrisburg Gas Company.

Richard L. James

After graduating from the University of Pennsylvania, mechanical engineering class of 1895, he entered the employ of the Pencoyn Iron Works, near Philadelphia. In the spring of 1898 he became associated with the Philadelphia Gas Works Company. He was then transferred to the United Gas Improvement Company, the parent company, assisting in operating and engineering activities in the home office, and in affiliated companies. His later activities included engineer of the Des Moines, Iowa, Gas Company; superintendent of the Vicksburg, Miss., Gas Company; superintendent of the gas department of the Main Line Division of the Philadelphia Electric Company; engineer of the Reading Gas Company, and manager of the operating department of the Harrisburg Gas Company.

Mr. Bains has been active on technical and engineering committees of the Pennsylvania Gas Association and the American Gas Association.

Richard L. James graduated from Lehigh University, mechanical engineering, class of 1908. He became associated with the Philadelphia Gas Works Company in 1915 and after extensive experience in operating, construction and distribution activities with the United Gas Improvement Company he was transferred to the Harrisburg Gas Company in 1922 as assistant manager of the operating department.

Mr. James, in addition to other organizations, is a member of the American Gas Association and Pennsylvania Gas Association.

Beebee Succeeds Russell as President Of Rochester Gas and Electric Corporation

A. M. Beebee

A HOME town boy, born and reared in the city of Rochester, became president of one of its largest industries when Alexander M. Beebee was elected to that office at the December meeting of the Board of Directors of the Rochester Gas and Electric Corporation. Mr. Beebee succeeds Herman Russell, who was elevated to the post of Chairman of the Board, vacated by Edward G. Miner who held it for nearly 15 years. Mr. Miner becomes chairman of the Executive Committee.

Herman Russell

Mr. Beebee was born in Rochester in 1893, attended East High School where he was a track star, and was graduated from Cornell University with the degree of Mechanical Engineering in 1915. He entered the employ of the R. G. & E. in January 1916 as a cadet engineer in the gas manufacturing department and has been with the company ever since. In 1921 he was made assistant superintendent of gas manufacture and in 1927 became general superintendent. In December 1944 he was made vice-president in charge of gas operations.

Long regarded as one of the foremost gas engineers of the country Mr. Beebee has filled many important posts in the American Gas Association and is now a director of that organization. He showed outstanding leadership during recent years as chairman of the Association's Postwar Planning Committee. During the past two years he has been active in the promotion of kitchen ventilation and a ventilation plan devised by him and the engineers of his department has become nationally known as the "Rochester system."

Mr. Russell was born in Manistee, Michigan, in 1878 and attended the public schools there. He entered the University of Michigan at the age of 16 and was graduated with a B.S. degree in 1898. Following post-graduate work in chemistry and gas engineering he won his master's degree in 1900. After leaving college his first job was with the Detroit Gas Company where he became assistant superintendent. In 1903 he went to the San Francisco Gas and Electric Company and in 1905 went to Rochester to become assistant superintendent of the gas works. He was made assistant general manager in 1914, general manager in 1919, vice-president in 1922 and president in December, 1929.

Mr. Russell served as president of the American Gas Association, the highest post in the industry, in 1937, and was instrumental in promoting the first national advertising campaign for the industry. In 1912 Mr. Russell won the city tennis championship, which he held for three years. He has long been active in community enterprises, having served as president of the Chamber of Commerce, Rochester Civic Improvement Association, Rochester Industrial Development Corporation and as a director of local educational and welfare organizations.

Mr. Miner has served as chairman of the Board of Directors of Rochester Gas and Electric since July 1932 and has been chairman of the Board of Pfaudler Company since retiring as president some years ago. In 1940 he was awarded the Rochester Civic Medal for outstanding contributions in the field of industrial science and as a distinguished patron of the arts and sciences. He has served as chairman of the Board of Trustees of the University of Rochester and as head or director of many civic organizations.

Stroud and Schedler Join Sales Force

THE Moore Corporation, Joliet, Ill., has announced the addition to its sales force of Herbert L. Stroud, formerly of Moore, and supervisor of federal construction work at southern points during the war. Harry J. Schedler, formerly in charge of the Moduflow division, Minneapolis-Honeywell Company, has been appointed a district manager of Moore with headquarters in Milwaukee.

Coleman Appointments

WALTER J. WELDON, formerly general manager of the Coleman Lamp and Stove Co., Ltd., Toronto, has been named director of export for the entire company.

Charles R. Conn, former sales manager of the Canadian company, succeeds Mr. Weldon. Both appointments were effective January 1.

Cook Honored

JAMES COOK of White Plains, N. Y., manager of the dealers division of the Westchester Lighting Company and editor of the Architect's Blueprint, organ of Westchester Chapter, American Institute of Architects, was presented with a watch in recognition of his efforts for the chapter, at its annual Christmas dinner.

Bart Walther, president, was toastmaster, while Ted Homa was chairman of the entertainment committee. The dinner was attended by 75 members and guests. Frederick H. Voss, Otto J. Gette and Edward Sleagle were members of the committee which selected and made the presentation to Mr. Cook.

Appointed A. G. A. Assistant Director of Promotion

Clifford E. Hall

APPOINTMENT of Clifford E. Hall as assistant director of the Promotional Bureau of the American Gas Association has been announced by H. Carl Wolf, A. G. A. managing director. He will assist John H. White, Jr., director of the Bureau, in carrying out the greatly enlarged promotional program included in the gas industry's Research and Promotional Plan.

As a reporter on the Waterbury Republican and American, Waterbury, Conn., for five years, Mr. Hall contributed to the winning of the Pulitzer Prize for those newspapers in 1939. He was assistant director of public relations for the Connecticut Light and Power Co. for three and one-half years, during which time his work was frequently cited by the Public Utilities Advertising Association.

He has been a member of the creative staff of Batten, Barton, Durstine and Osborn, advertising agency, and was director of press publicity of United China Relief. Prior to joining the American Gas Association Promotional Bureau in July, 1946, he was assistant director of public relations for American Home Products Corporation.

Harry Newcomb Named Executive Vice-President

Harry Newcomb

HARRY NEWCOMB, present vice-president and assistant to the president, was named executive vice-president of Servel, Inc., it has been announced by Louis Ruthenburg, president of the company.

Mr. Newcomb joined Servel in the fall of 1934 as manager of the Commercial Refrigeration Division. In 1942, he was made vice-president and manager of the Electric Refrigeration Division, and in 1943 he was appointed assistant to the president, retaining the title of vice-president.

Mr. Newcomb was previously with the Norge Division of the Borg-Warner Corporation, and before that was associated with the Copeland Refrigerator Company.

Bryant Vice-Presidents

James N. Crawford

APPOINTMENT of James N. Crawford and William R. Teller as vice-presidents of Bryant Heater Company has been announced by Lyle C. Harvey, president of the company.

Both Mr. Crawford, formerly sales manager, and Mr. Teller, heretofore director of engineering and development, will continue work in their respective fields.

The appointments reflect the expanded operations of the company, which are utilizing an additional Cleveland plant and a new plant in Tyler, Texas.

William R. Teller

Mr. Crawford is a native of Cleveland and a graduate of Case School of Applied Science, which granted him a Bachelor of Science degree in Mechanical Engineering. He is a member of Phi Kappa Psi social fraternity, and of Tau Beta Pi Honorary scholastic society.

A member of the staff of the American Gas Association's Testing Laboratory following his graduation from Case, Mr. Crawford became associated with his present Company in 1933 and is well-known in the gas heating sales field.

Mr. Teller, who has directed Bryant's research and development since 1944, was previously associated with the Cleveland Testing Laboratories of the American Gas Association as assistant director. A member of Sigma Chi, he was graduated from Case School of Applied Science in 1927 with the degree of bachelor of science in mechanical engineering and spent the following three years gaining field experience in gas and oil production in western Kentucky.

Hlavin Joins Detroit Brass

ROBERT T. HLAVIN, for several years a member of the staff of the American Gas Association Testing Laboratories, has joined the gas valve division of the Detroit Brass and Malleable Works as assistant to William J. Wildern, manager of the division.

Mr. Hlavin had been associated with the A. G. A. since his graduation as a chemical engineer from Case School of Applied Science. In his four years affiliation with the A. G. A., he served as a test engineer in the Central Heating Laboratory and as test engineer in charge of the water heater, range and space heater laboratories. His experience and knowledge of gas appliances was furthered by almost two years of service in the capacity of a field inspector.

He saw five years of service with the armed forces as an artilleryman and a staff officer.

Schmidt Board Chairman

AT a meeting of the Board of Directors of the Consolidated Gas Electric Light and Power Company of Baltimore held Dec. 19 Wm. Schmidt, Jr., president of the company, was also elected chairman of the Board of Directors to fill the vacancy caused by the death of Charles M. Cohn.

Charles P. Crane, executive vice-president, was elected a member of the Board of Directors and of the Executive Committee at the same meeting.

New A. G. A. Personnel

AMONG recent additions to the American Gas Association's headquarters personnel are two former gas company employees:

Mrs. Helen Tull, secretary to Jessie McQueen, home service counsellor, was employed by the Wisconsin Power and Light Co., Madison, for six years. Mrs. Lorraine Lippoff, new member of the auditing department, spent five years at the Portland Gas and Coke Co., Portland, Oregon.

Cooking Institute Names Little

STANLEY E. LITTLE, vice-president in charge of sales for American Stove Co. in Cleveland, has been elected vice-president and trustee of the Institute of Cooking and Heating Appliance Manufacturers, according to a recent announcement by the Institute.

Mr. Little has been actively engaged in Institute activities as well as other nation-wide organizations within the gas industry. In his new post, he will help to reconvert the Institute to a peacetime basis.

Olds Resigns F.P.C. Chairmanship

LELAND OLDS has resigned as chairman of The Federal Power Commission, a responsibility which he has had almost continuously for the past 7 years. He will continue to serve on the Commission, however.

Nelson Lee Smith of Hopkinton, New Hampshire, has been elected chairman and Richard Sachse of Fall Brook, California, has been named vice-chairman, effective January 1, 1947.

Hulcy Elected

D. A. Hulcy, president of Lone Star Gas Company, was elected president of the Dallas Chamber of Commerce in December. He took office January 1. Mr. Hulcy has been a member of the board of directors of the Dallas Chamber for a number of years. He is chairman of the Promotional Committee of the American Gas Association.

Jones Promoted

ROY E. JONES, for the past four years division manager of the North Shore Gas Co., Waukegan, Ill., has been appointed sales and advertising manager of the company.

Prior to joining North Shore Gas Co., he did graduate work in utility management in Harvard School of Business, and spent several years with utility companies in Ohio and Colorado.

In his new position, he will head up an extensive sales and advertising program to be launched when the company converts to natural gas next spring.

Obituary

Charles M. Cohn

CHARLES M. COHN, chairman of the board of directors of Consolidated Gas Electric Light and Power Co. of Baltimore died December 5 after a short illness. Mr. Cohn, who was born on April 25, 1873, was educated in the public schools of Baltimore, Business College (1893), graduated in Law and admitted to the Bar in 1895; graduated from Loyola College (A.B. Degree) in 1897; awarded an M.A. Degree by Loyola College in 1899 and the Honorary Degree of Doctor of Laws in 1942.

Mr. Cohn entered the employ of the Consolidated Gas Company of Baltimore, a predecessor of the present company, in 1885, when that company was engaged solely in supplying gas for illumination in residences, a few commercial establishments, and for street lighting. In 1906 the electric company and the gas company were merged, forming the present Consolidated Gas Electric Light and Power Company of Baltimore. Mr. Cohn, who had been secretary of the old gas company, was elected secretary of the new company at that time and in 1907 was elected a director of the company.

In 1910 Mr. Cohn was elected vice-president and general manager and later in the same year became vice-president in charge of the gas division. He was made a member of the Executive Committee in 1912 and in 1931 was elected executive vice-president. This office he held until 1942, at which time he was made president of the company.

In 1943 he was made chairman of the

board and president, holding these offices until 1946, when at his request he retired as president but continued to serve as chairman of the board.

He is survived by his sister Miss Pauline E. Cohn of Baltimore.

Mr. Cohn was a member of the Executive Committee and a director of The Fidelity Trust Co. and former member of the Executive Committee of the Industrial Building Co.; former director of the Baltimore Association of Commerce and the American Gas Association.

ARTHUR A. HIGGINS, for many years well known in the gas industry, died December 1 in Boston. He was in his 74th year.

Mr. Higgins started in the gas industry in 1906 as manager of the Providence, R. I., office of the Welsbach Company. In 1911 he went with the Providence Gas Co. as its sales manager and in 1926 became New England representative of the American Radiator Company. He retired from business in 1934.

Mr. Higgins was active at various times in affairs of the American Gas Association and the New England Gas Association. In 1921-22 he was chairman of the American Gas Association's Publicity and Advertising Committee.

Funeral services were held in Boston on December 4 and burial was at Orleans, Mass.

He is survived by his widow, Clara B. (Power) Higgins, and two sons, Arthur A. Jr., and Gerald.

O. LLOYD MADDUX of the O. Lloyd Maddux Company, New York, died on November 26, as a result of an injury sustained in his home at Chatham, N. J.

Mr. Maddux was widely known in the utility field which he entered in 1911 after attending Wofford College. Born in Spartanburg, S. C., he was employed for a time by the Spartanburg Railway Gas and Electric Co., and later was connected with similar companies in Georgia, West Virginia and Virginia. Following three years' service in World War I, he was affiliated as an engineer with the Ruud Manufacturing Co., Pittsburgh, Pa., the United Gas and Fuel Co., the Union Gas Company of Canada, the Hamilton By-Products Coke Ovens Ltd., and the United Suburban Gas Co. Ltd. before entering his own business in New York in 1937 where he represented the Eclipse Fuel Engineering Co., Rockford, Ill.

He was active in the affairs of the American Gas Association, and made many contributions to gas industry progress over the years. Mr. Maddux was a member of A. G. A., the American Society of Heating and Ventilating Engineers, Royal Hamilton Yacht Club of Canada, and the Grand Avenue Club in London, England. He is survived by his widow, three daughters, a son, and two sisters.

A. F. RICE, manager of western region appliance sales for Rheem Manufacturing Co., died in the crash of an airliner near Burbank, California, November 13.

Mr. Rice joined Rheem September 8, 1945 after serving during the war as lieutenant colonel of engineers in construction and maintenance attached to the Army Air Forces.

For more than 25 years prior to the war he had held positions with such firms as Occidental Stove Company of San Francisco, in which he was a partner and general manager; Southern California Gas Company of Los Angeles, where he was manager of marketing development; H. R. Basford Company of San Francisco, where he was sales manager, and Western Stove Company where he was partner and general manager.

He was active for Rheem in a number of business associations and professional groups and was a member of the Society of Military Engineers, the executive committee of the Pacific Gas Association, and the Association of Gas Appliance and Equipment Manufacturers.

He is survived by his widow, Mrs. Laura Alice Rice, and two daughters, Mrs. Robert H. Clark and Laura Frances, and one grandchild.

GAS ENRICHMENT OILS

(Continued from page 24)

Such variations, due mainly to the type of equipment used and other process variables seem to indicate that every manufacturer has his own specific problem and any effect of quality on his operation will not be generally applicable to the rest. However, some broad generalities can be drawn for both the light and heavy gas oil operations respectively.

The two major types of distillates which can be used for gas enriching purposes are: Light gas-oil as typified by Standard light gas-oil and No. 2 fuel oil. Table 3 shows the comparison of typical physical and chemical properties of these light distillates. It will be noted that the major differences lie in the distillation range, pour point, aniline point, diesel index and the gas enriching value. It is a well known fact that the gas enriching value of an oil depends upon its composition and that the more paraffinic the oil the higher will be the gas enriching value. The product of A.P.I. gravity and aniline point divided by 100 gives us a value known as Diesel Index which is a very good indication of paraffinicity, the higher the Diesel Index the more paraffinic the oil. The higher pour point indicates the presence of greater amounts of paraffin waxes in the higher boiling range fractions. The higher boiling range indicates the presence of heavier hydrocarbons which are easier to crack into components desirable for gas enriching purposes. Thus the examination of the table shows that the Standard light gas-oil is a straight run paraffinic oil of fairly high boiling range containing some paraffin wax and having a good gas enriching value. No. 2 fuel oil on the other hand appears to be a cracked oil, which is not particularly paraffinic, of lower boiling range containing practically no paraffin wax and has only a fair gas enriching value.

Both Are Suitable

However, in all other respects, as shown by the rest of the inspections, both are entirely suitable for satisfactory operation. Granting that the gas making operations will be slightly easier to control using the Standard light gas-oil, the major difference in the value of these two oils to the manufactured gas industry is the difference in the gas enriching value since the utilization will be roughly proportional to this. Therefore, neglecting the slight difference in the general operating cost, Standard light gas oil should be worth approximately 10 percent more to the gas industry than No. 2 fuel oil based upon the relationship of the two gas enriching values. At present there is a base price differential of only 0.1-0.2 cents per gallon which is only a two percent to three percent difference in cost. It seems probable that this base differential will increase in the near future as the standard light gas-oil is highly competitive from the refinery viewpoint with premium cracking stocks for high octane gasoline and with premium diesel and gas turbine fuels, and since a larger expansion can be foreseen for the two latter items, the price of Standard light gas-oil may be expected to reflect this competition. However, the gas manufacturers in surveying their economics should always bear in mind that the operation on No. 2 fuel oil may be made to be more profitable than at present if advantage is taken of the fact that tar is a valuable by-product, and the equipment can be made available for its recovery. It may be said that the tar production is roughly proportional to the difference between the gross heating value and the gas enriching

value of the oil. Thus in changing over from Standard light gas-oil to No. 2 fuel oil a 25-35 percent increase in tar production may be expected.

Table 4 shows two major types of heavy oils used, Residuum gas-oil which is a typical heavy gas-oil and bunker "C" which is a typical residual. Again Residuum gas-oil is a straight run, predominantly paraffinic oil, while Bunker "C" is wholly or at least partially cracked stock which is more naphthenic in character. The major differences which can be noted in the table are the gas enrichment value, viscosity, carbon residue, gravity, flash point and sulfur. The last two have no particular effect on the performance characteristics, but the first four are of importance.

Although neither gravity nor viscosity in themselves have any pronounced effect on the operation, they are important in that they measure the paraffinicity of the oil and thus its gas enrichment value. The gas enrichment value, of course, is indicative of how much oil will be needed for enrichment. There is some evidence at hand that Conradson Carbon Residue also has some bearing on oil utilization figures.

Apparently, when the residue figure is high more oil is required even if two samples have the same estimated enriching values. Thus it will be noted that bunker "C" contains approximately two times as much carbonaceous matter as a residuum gas-oil. So again, just as in the case of light distillates, the major difference in the value of Residuum gas-oil and Bunker "C" to gas making industry is roughly proportional to the difference in their gas enrichment values, and the industry can afford to pay approximately a 15 percent differential. The present differential in the base price is approximately 0.7 cents per gallon, which represents what may be termed "the cost of selectivity" and amounts to approximately 15 percent. Bunker "C" operations are quite often more profitable than this slight price differential advantage appears to indicate. This depends again on the tar disposal, as Bunker "C" produces approximately 35-45 percent more tar than Residuum gas-oil.

If the gas manufacturer can recover all the tar and profitably dispose of it, he has a nice credit to the cost of operation. If this equipment, however, can not take care of all the tar which would result from operating on Bunker "C," the operator may find his greatest net profit in using residuum gas oil.

Summarizing the future outlook on the quality picture of the gas enrichment oils, we see the following:

Both the light and heavy oils fall into two classes, the straight run, pre-

TABLE 2

PERCENTAGE OF ALL LIGHT AND HEAVY FUEL OILS USED BY MANUFACTURED GAS INDUSTRY IN UNITED STATES—YEARS 1935–1945

(Thousand Barrels 42 Gallons)

Year	*Light Fuel Oils*		*Gas Oil % of Lt.F.O.*	*Heavy Fuel Oils**		*Gas Oil % of Hy.F.O.*
	All Uses	*Gas Enrichment*		*All Uses*	*Gas Enrichment*	
1935	86,028	4,156	4.8	280,695	8,001	2.9
1936	102,757	3,222	3.1	307,884	9,092	3.0
1937	116,841	3,149	2.7	325,514	9,401	2.9
1938	117,449	3,058	2.6	291,833	10,889	3.7
1939	134,973	3,352	2.5	323,488	11,628	3.6
1940	160,851	3,448	2.1	340,163	12,672	3.7
1941	172,762†	3,689	2.1	381,231†	12,797	3.4
1942	181,327†	4,107	2.3	386,082†	13,768	3.6
1943	187,054†	4,704	2.5	426,192†	13,662	3.2
1944	194,100†	4,086	2.1	454,622†	15,836	3.5
1945	206,418†	4,200‡	2.0	499,030†	16,400‡	3.3

*Includes some boiler fuel oil.

†For these years the figures as shown are less than the consumption reported by the Bureau of Mines. Deductions have been made for military exports.

‡Estimated.

TABLE 3

TYPICAL INSPECTIONS OF NO. 2 FUEL OIL VS. STANDARD LIGHT GAS OIL

Test	*No. 2 Fuel Oil*	*Standard Light Gas Oil*
Flash, °F	150	185
Sulfur, Wt. Percent	0.18	0.3
Aniline Point °F	127	163
Ash, Weight Percent	Trace	Trace
Corrosion	Pass	Pass
Distillation (ASTM) °F		
10 Percent	435	470
50 Percent	505	550
90 Percent	600	630
EP	645	720
Carbon Residue (10 Percent Bottoms)	0.08	0.05
Water and Sediment, Vol. Percent	Trace	Trace
Diesel Index	42	57
Pour	—15	10
Gravity, Degree API	33	35
Gas Enriching Value (B.t.u. per Gallon)	97,000	107,000

TABLE 4

TYPICAL INSPECTIONS OF RESIDUAL FUEL OIL VS. STANDARD RESIDUUM GAS OIL

Test	*No. 6 Fuel Oil*	*Standard Residuum Gas Oil*
Flash, °F	175	195
Conradson carbon residue, Wt. Percent	8.0	4.0
Viscosity @ 122 °F S.S.F.	100	—
Viscosity @ 210 °F S.S.U.	78	47
Sulfur, Wt. Percent	1.3	0.8
Ash, Wt. Percent	0.1	Trace
Water and Sediment, Vol. Percent	0.2	0.1
Gravity, Degree API	13.5	22.0
Gas Enriching Value (B.t.u. per Gallon)	91,000	105,000

dominantly paraffinic oils, which comprise the premium quality classes and the cracked predominantly naphthenic oil which can be satisfactorily used and in some cases may show a more profitable operation.

Economically speaking, the future of the light gas-oils appears to be hazardous. Standard light gas-oil is highly competitive in the refinery with premium stocks needed for the production of high octane gasoline, premium diesel fuels, gas turbine fuels and jet engine fuels. Thus it either will have to advance in price or decrease in availability. The quality differential between it and No. 2 fuel oil is approximately 10 percent and yet the cost differential is but two percent or three percent. Any gas manufacturer operating on a nearly break even basis using Standard light gas-oil is facing difficulties.

The heavy oil side of the picture is much brighter, even though the residuum gas-oil is in the same situation at the refinery as the Standard light gas-oil. The manufacturer can switch to Bunker "C" and can save money if, as is usually the case, he is in a good position to take advantage of 35-45 percent increase in tar yield. If that is not the case, he may be able to afford equipment changeovers which will enable him to do so, as he will be able to recover the capital costs from tar profits.

GAS INDUSTRY 1946

(Continued from page 8)

conferences covering gas production, chemical, distribution and motor vehicle practices. It also carried on many technical research projects, published engineering handbooks and manuals, issued safe practice pamphlets, and generally contributed to the advancement of gas operating techniques.

A development of interest to the technical men was the introduction on an experimental basis of plastic tubing for gas service piping as a substitute for conventional metallic pipe. At least one large gas utility completed extensive tests on such gas arteries and reported promising results.

The use of radio for prompt communication in emergencies and for other purposes is increasing steadily. In 1944, less than 30 gas companies were using this modern vehicle while early in 1946, it was found that 57 gas companies were using this form of communication.

Conclusion

It is evident from this brief summary that the gas industry has increased its stature as a vital factor in the nation's economy and in the everyday lives of the people. Its record is one of constructive achievement and its pipelines to the future are strong indeed. We have passed the 1946 milestone and look forward confidently to the next.

NEW REFRIGERATOR

(Continued from page 9)

consider the units and the improvements on these.

1. The evaporators, though still using extruded sections, are much better in appearance than previous ones because only the smooth aluminum interior is visible. Also the single opening makes it easier to clean after the infrequent defrosting operation.

2. The vertical generator has been applied to the 400A and 600A models at the request of the manufactured gas utilities. It is the plan to eventually apply this to the other units provided it is accepted by the service organizations and sales groups as an improvement. From the user standpoint its benefits are intangible and cannot be evaluated, but if, as is expected, it reduces service calls, every one gains.

3. Gas consumption even with the improved performance incorporated in these refrigerators is the same or better than with the "R" models.

The controls and miscellaneous accessories are just more of the many improvements made in this completely new postwar Servel.

1. A new smaller thermostat has been developed and is used on the entire line.

2. The gas burners have been redesigned. The burner bracket has been changed and is clamped to the burner at the top of the burner. This permits a rigid mounting and accurate factory adjusted alignment on vertical generator models. Threads on the burner tubes are coarser and there should definitely be less stripped threads due to threads crossed by service men in working on these burners.

3. A new trigger, of course, had to be used with the tray used with the new evaporator. This tray can be used with old models because the only change is to change the shape of the trigger.

In summarizing, the "S" models were designed by the man selling and servicing them in the field. Comments from the field and from salesmen were summarized and studied by the engineers. These comments and suggestions were then incorporated into working equipment as nearly as possible considering production and engineering limitations. The result is a product which contains at least some of the thoughts of almost everyone connected with the product from its inception to its production and sale as a finished product. The product is new and modern, but is not an extreme design. Although the market is still very much a seller's market, the design is such we can approach a buyer's market with confidence and sell in competition with all comers.

NATIONAL ADVERTISING

(Continued from page 16)

a ratio of 6 to 1. For the first quarter of 1946 Servel spent $68,020, followed by a step-up in advertising for the second quarter—another hopeful sign. (Servel's new program starts in December.)

Competition's advertising of water heaters in national media appears for the first time during the first six months of 1946, but in the small volume of $17,077. There was no advertising of this nature by the manufacturers of gas water heaters during that period although such advertising has appeared recently and will be shown when figures are made available for the last six months of 1946.

Competition has not been as active in advertising all-electric kitchens as heretofore. It invested only $56,280 in such advertising the first half of this year. There was no comparable magazine advertising by gas appliance manufacturers. The A. G. A. spent $236,041 in advertising which depicted New Freedom Gas Kitchens in the main illustrations as an attention-arresting device to demonstrate that a kitchen does not have to be electric to be modern, but the remainder of each ad contained strong selling copy on the gas appliances shown in the kitchen illustrated. This shift of emphasis from the kitchen as a dominating theme to the appliances themselves became more pronounced as the program developed.

Summing up the use of national magazine advertising devoted to electric versus gas appliances, the figures reveal that manufacturers of competing electric equipment spent $1,523,567 the first six months of 1946 in contrast with $759,635 spent by the gas appliance manufacturers and the A. G. A. This is a ratio of 2 to 1 in favor of competition.

To complete the picture it is neces-

sary to include the amount invested by electric appliance manufacturers in radio network shows devoted to the promotion of competing appliances. The total for six months of 1946 was $1,776,538. There was no investment by the gas industry in network radio for this period. Competition's use of national magazine advertising and radio total $3,301,095 for the first six months of 1946. The gas appliance manufacturers and the A. G. A. spent $759,635—a ratio of 4 to 1 in favor of competition.

Need more be said to prove the point that competition has the jump on us. There must be a larger volume of national advertising by gas appliance manufacturers, either by means of independent campaigns or collectively. Also, there must be no reduction in volume of A. G. A. advertising. There is a joint responsibility involved here. Let's accept it.

GAS COMPANIES*

Continental Oil Co., Ponca City, Okla. (F. B. Haverfield, Manager)

New York State Natural Gas Corp., Pittsburgh, Pa. (E. M. Borger, President)

MANUFACTURER COMPANIES*

American Heating & Engineering Co., New Albany, Ind. (J. Moskowitz, General Manager)

Brown-Hart Engineering Corp., Detroit, Mich. (R. C. Brown, President)

Brown Stove Works, Inc., Cleveland, Tenn. (K. H. Brown, Secretary)

Dalzen Tool & Mfg. Co., Detroit, Mich. (Fred Dalzen, Factory Manager)

Iron Firemen Mfg. Co., Cleveland, Ohio (C. T. Burg, Vice President)

Jerry Finn Heating Engineers, St. Paul, Minn. (Jerry Finn, Owner)

Keeley Stove Co., The, Columbia, Pa. (W. B. Ruthart, Manager)

Lyons-Alpha Products Co., Inc., New York, N. Y. (D. H. Goldstein, Vice President)

Muncie Burner Mfg., Romulus, Mich. (A. E. Canter, Owner)

National Gas Eqpt. Co., Inc., Dallas, Texas (John DuBois, Sales Manager)

Nineteen Hundred Corp., St. Joseph, Mich. (P. E. Geldhof, Vice President)

Norton-McMurray Mfg. Co., Chicago, Ill. (F. A. McMurray, President)

Penn Boiler & Burner Mfg. Co., Lancaster, Pa. (Paul Sachs, Engineer)

Sampsel Time Control, Inc., Spring Valley, Ill. (Louis Putze, General Manager)

Sequoia Manufacturing Co., San Carlos, Calif. (H. R. Kramer, President)

Standard Heating Co., St. Louis, Mo. (I. Vernon Brumbaugh, Engineer)

Sullivan Valve & Engineering Co., Butte, Ind. (T. J. Sullivan, President)

Tinnerman Products, Inc., Cleveland, Ohio (A. H. Tinnerman, President)

United States Air Conditioning Corp., Minneapolis, Minn. (William E. Snider, Design Engineer)

Vacuum Gas Burner Co., Olean, N. Y. (R. C. Ware, General Manager)

INDIVIDUAL MEMBERS

Chas. B. Abbot, Colorado Interstate Gas Co., Colorado Springs, Colo.

Howard R. Batchelder, Institute of Gas Technology, Chicago, Ill.

Valant H. Berwick, The Cleveland Elec. Illuminating Co., Cleveland, Ohio

James M. Boggs, Colorado Interstate Gas Co., Colorado Springs, Colo.

H. T. E. Bosbery, Pacific Gas & Electric Co., San Francisco, Calif.

J. C. Brackenborough, National Utilities Co. of Michigan, Sturgis, Mich.

J. A. Bramblett, Fall River Gas Works Co., Fall River, Mass.

Marshall Brown, Pacific Public Service Co., San Francisco, Calif.

Albert Budman, Budco Inc., Detroit, Mich.

Mrs. Mary Belle Burnett, The Cincinnati Gas & Elec. Co., Cincinnati, Ohio

J. J. Burns, Telechron, Inc., San Francisco, Calif.

Williams T. Burns, Kings County Lighting Co., Brooklyn, N. Y.

H. Frank Carey, Long Island Lighting Co., Mineola, N. Y.

J. L. Case, San Diego, Calif.

L. H. Case, Gas Consumers Association, Washington, D. C.

Francis A. Cheeseman, The Wandsworth & District Gas Co., Wandsworth, England

E. A. Clark, Coast Counties Gas & Electric Co., Santa Cruz, Calif.

J. J. Corrigan, Gas Consumers Association, Chicago, Ill.

R. K. Corwin, Coast Counties Gas & Electric Co., Santa Cruz, Calif.

James T. Costigan, The Sharples Corp., New York, N. Y.

George D. Creelman, The M. A. Hanna Corp., Cleveland, Ohio

C. F. Cushing, Payne Furnace Co., Beverly Hills, Calif.

G. C. Dakan, Coast Counties Gas & Electric Co., Santa Cruz, Calif.

Hugh R. Derrick, Chattanooga Gas Co., Chattanooga, Tenn.

Walter F. Devitt, Lynn Gas & Electric Co., Lynn, Mass.

O. B. Dickson, Pacific Gas & Electric Co., Oakland, Calif.

Harry S. Dossel, Harry Dossel Appliance Co., Tampa, Fla.

Hugo W. Druehl, Pacific Public Service Co., San Francisco, Calif.

John A. Eppler, Pacific Gas & Electric Co., Salinas, Calif.

J. R. Ewell, Day & Night Mfg. Co., Monrovia, Calif.

J. William Ferguson, U. S. Bureau of Mines, Amarillo, Texas

Barbara L. Foote, Pacific Gas & Electric Co., Oakland, Calif.

Carl Frunk, Pacific Gas & Electric Co., Stockton, Calif.

D. W. Frye, Columbian Carbon Corp., Shamrock, Texas

G. P. Garver, Natural Gas Pipeline Co. of America, Chicago, Ill.

H. J. Geibel, E. F. Griffiths Co., Philadelphia, Pa.

Nathan H. Gellert, Jr., Seattle Gas Co., Seattle, Wash.

Robert H. Gerdes, Pacific Gas & Electric Co., San Francisco, Calif.

David H. Goldstein, Lyons-Alpha Products Co., Inc., New York, N. Y.

Earl Goon, National Utilities of Michigan, Benton Harbor, Mich.

M. B. Graham, Day & Night Mfg. Co., Monrovia, Calif.

E. T. Gushee, The Detroit Edison Co., Detroit, Mich.

Henry Hakewill, Institute of Gas Technology, Chicago, Ill.

Benj. G. Harmon, The Gas Machinery Co., Chicago, Ill.

James A. Hartnett, Honeywell Brown Ltd., Middlesex, England

Frederick T. Head, Consolidated Edison Co. of N. Y., Inc., New York, N. Y.

Prof. L. Kermit Herndon, Ohio State University, Columbus, Ohio

William A. Herr, Philadelphia Electric Co., Philadelphia, Pa.

James R. Hinchliffe, Jr., Gas Consumers Association, Washington, D. C.

R. E. Hoffman, Coast Counties Gas & Electric Co., Santa Cruz, Calif.

Jack D. Hogan, Michigan Consolidated Gas Co., Ann Arbor, Mich.

John W. Hopkins, Colorado Interstate Gas Co., Pueblo, Colo.

A. J. Horn, Payne Furnace Co., Beverly Hills, Calif.

H. M. Hunter, The Canadian Western Nat. Gas, Lt., Heat & Pr. Co., Ltd., Calgary, Alberta

R. B. Ives, Gas Consumers Association, Philadelphia, Pa.

Roy C. Joiner, Roy C. Joiner Co., Atlanta, Ga.

Gordon M. Jones, Consumers Gas Co., Reading, Pa.

Harold W. Jones, The Philadelphia Gas Works Co., Philadelphia, Pa.

Carl E. Kayser, Columbian Carbon Co., New

*Names in parentheses are Company Delegates of the American Gas Association.

York, N. Y.
P. C. Keith, Hydrocarbon Research, Inc., New York, N. Y.
H. A. Kievenaar, Boston Consolidated Gas Co., Boston, Mass.
Howard Kroehl, Seattle Gas Co., Seattle, Wash.
Stephen A. Kuntz, Philadelphia Electric Co., Philadelphia, Pa.
Clyde L. Lee, Northwest Cities Gas Co., Astoria, Ore.
Lester L. Luxon, American Liquid Gas Corp., Los Angeles, Calif.
Howard B. Lyman, Honolulu Gas Co., Honolulu, Hawaii
Harold J. MacKay, Surface Combustion Corp., New York, N. Y.
Muse E. Mann, Georgia Power Co., Columbus, Ga.
James A. Marvin, F. W. Lafrentz & Co., New York, N. Y.
Michael Mavromates, Municipal Gas Works, Athens, Greece
Rudolph Maycen, Shell Oil Co., Inc., Chicago, Ill.
Yale McCort, National Utilities Co. of Michigan, Traverse City, Mich.
Richard E. McLaughlin, Lever Brothers Co., Cambridge, Mass.
F. F. McMullen, United Gas Corp., Houston, Texas
J. A. Meier, General Gas Light Co., New York, N. Y.
Austin W. Merchant, Michigan Consolidated Gas Co., Detroit, Mich.
Maury Millar, The Paraffine Cos., Inc., San Francisco, Calif.
N. R. Millard, Boston Consolidated Gas Co., Boston, Mass.
Spencer A. Moore, Public Service Electric & Gas Co., Newark, N. J.
Andrew S. Morgan, Allentown-Bethlehem Gas Co., Bethlehem, Pa.
G. E. Nadolske, North Penn Gas Co., Port Allegany, Pa.
T. J. Nesdale, Gas Consumers Association, Providence, R. I.
R. G. Olmsted, Long Island Lighting Co., Mineola, N. Y.
Frederick V. Olney, Kansas City Gas Co., Kansas City, Mo.
D. W. Olsen, Northwest Cities Gas Co., Walla Walla, Wash.
Peter R. Paffen, Peter R. Paffen, Inc., Cambridge, Mass.
Earl F. Palmer, Heyden Chemical Corp., Morgantown, West Va.
Henry W. Parker, Allentown-Bethlehem Gas Co., Bethlehem, Pa.
John A. Penote, The Cleveland Trencher Co., Euclid, Ohio
Andrew J. Perry, Jr., Pacific Gas & Electric Co., Oakland, Calif.
Kenneth W. Person, Minneapolis Gas Light Co., Minneapolis, Minn..
Gerald M. Platz, Institute of Gas Technology, Chicago, Ill.
Adolph Pokras, A. O. Smith Corp., Kankakee, Ill.
C. W. Pracht, Coast Counties Gas & Electric Co., Santa Cruz, Calif.
D. D. Purrington, Calor Gas Co., Oakland, Calif.
Philip E. Reynolds, Pacific Gas & Electric Co., Berkeley, Calif.
F. W. Richards, The Coleman Co., Inc., Wichita, Kansas
Wm. S. Riley, Koppers Co., Tax & Chemical Div., Pittsburgh, Pa.
H. L. F. Rincker, Dutch East Indies Gas Co., Amsterdam, Holland
John F. Rolph, Jr., United Engineers & Constructors, Inc., Philadelphia, Pa.
Howard Rountree, San Diego Gas & Electric Co., San Diego, Calif.
James A. Ryan, Consolidated Edison Co. of N. Y., Inc., New York, N. Y.
Roy Sager, National Utilities Co. of Michigan, Otsego, Mich.
Harold P. Saueressig, Honolulu Gas Co., Honolulu, Hawaii
L. P. J. M. Sauter, N. V. Nederlandsch-Indische Gas-Mij, Rotterdam, Holland
Bruno Schlack, Philadelphia Electric Co., Philadelphia, Pa.
John B. Schmid, Long Island Lighting Co., Mineola, N. Y.
John F. Schuldt, The Peoples Gas Light & Coke Co., Chicago, Ill.
Robert J. Selbach, Public Service Electric & Gas Co., Newark, N. J.
Milton F. Shaffer, The Shamrock Oil & Gas Corp., Amarillo, Texas
William E .Sheddan, Jacksonville Gas Corp., Jacksonville, Fla.
Deane N. Shephard, Honolulu Gas Co., Honolulu, Hawaii
Alamjit D. Singh, Institute of Gas Technology, Chicago, Ill.
Charles J. Smith, Consolidated Edison Co. of N. Y., Inc., New York, N. Y.
Helen A. Smith, Syracuse University, Syracuse, N. Y.
H. L. Smith, Pacific Gas & Electric Co., Mountain View, Calif.
Harold W. Smith, American Liquid Gas Corp., Los Angeles, Calif.
Richard D. Smith, Seattle Gas Co., Seattle, Wash.
Harold Stevens, Bituminous Coal Producers Advisory Board Dist. No. 8, Cincinnati, Ohio
George Thayer, Seattle Gas Co., Seattle, Wash.

(Space does not permit publication of all new members. Other new members will appear in an early issue.)

Personnel Service

SERVICES OFFERED

Industrial Gas Sales Engineer would like position with future with gas utility, or sales connection with equipment manufacturers. Now employed as District Industrial Sales Manager, large natural gas utility. Licensed Professional Engineer, 19 years experience with good record in sales and supervision of sales of natural gas furnaces and burners. (42). **1532.**

Territorial **Sales** and **Service Representative.** Would like anything requiring promotional contact through utilities. Eighteen years wide Sales experience with two large stove organizations. **1533.**

Technical Writer and Industrial **Engineer.** College Graduate. Air Conditioning, also experience with Diesel generator concerns. Thorough knowledge and experience with production procedures, scheduling, expediting, purchasing and sales. Edited magazines and wrote many Technical Manuals. Liaison Engineer. Possesses initiative, tact, energy; get along well with people; adaptable. Married (30). **1534.**

Seven years **General** and **Property Accounting** Supervision; familiar with NARUC and FPC prescriptions; adaptation of forms to and use of IBM tabulating machines; original cost and depreciation studies; preparation and perpetuation of continuing property inventories; field and office cost audits and analyses; studies of office methods and preparation of procedures. **1535.**

Consulting Engineer—19 years experience in appliance field—familiar with A. G. A. requirements, and manufacturing processes—specialize in burner designs for all appliances—available on part-time fee basis. **1536.**

Experienced Executive—Management Assistant—Graduate Engineer with well rounded education and background in corporate affairs—worked in both electric and gas companies. Particularly interested in public relations having successfully carried out responsible assignments in this field. Veteran. **1537.**

Industrial Sales Manager graduate mechanical engineer with business administration training. Available immediately anywhere. Fifteen years supervisory experience. **1538.**

Administrative Assistant; over 20 years' experience as Secretary and General Assistant to President of large utilty holding company now being liquidated, desires positon vicinity of New York. Capable of handling correspondence, financial, research and statistical matters. Knowledge of accounting. **1539.**

Design, Production, Sales Engineer on Commercial and Industrial equipment immediately available; fifteen years successful experience in the gas industry. Single, college graduate 1927, can locate or travel anywhere. Intimate knowledge of production methods and layout; specification of production equipment and supplies. Further details and interview on request. (40). **1540.**

POSITIONS OPEN

One of the largest gas companies in the Middle West has an excellent opportunity for a **Mechanical Designer** 30 to 40 years of age with experience in plant layout, power plant equipment and reinforced concrete and steel. This position is not a temporary one and all replies will be treated confidentially. **0475.**

Recent Graduate **Mechanical Engineer.** Well established Western New York manufacturer requires services of a recent graduate with some experience in gas conversion burner and furnace testing and development work to assist chief engineer. Write fully, giving experience, salary expected and date available. Include photo if available. **0476.**

Gas Plant Engineer with minimum of two years experience in water gas production and three years college in engineering. Supervisory position Gas Plant operation, maintenance and construction. Middle Eastern Seaboard. **0477.**

Cadet Engineers, **engineering assistants,** graduates of recognized engineering schools, civil or mechanical degrees preferred. Age to 30; Start $200 and grow with organization. **0478.**

Engineer familiar with the manufacturing end of the gas industry to head up a department for the promotion of a new development. **0479.**

Services required of **Gas Engineer** to design radiant and circulating space heaters for new concern starting production in New Orleans. Competent consultant in different locality acceptable. Permanent or temporary. **0480.**

Experienced Home Economist who can qualify for company with approximately 154,000 meters: nine girls in the Home Service Department. Applicants must have a degree in Home Economics from an accredited college or university—prefer previous utility experience, radio and newspaper column writing. Give complete background as to experience, age, height, weight, include picture. State salary expected. Director will have complete charge of department including personnel. Company furnishes automobile. **0481.**

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